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January/February 2006

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January/February 2006
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The Optimum Performance Design & Build Resource For Environmentally Enhanced Lifespan Living

VOLUME 1, NUMBER 1, ISSUE 1
January/February 2006

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MISSION STATEMENT

The mission of *Ultimate Home Design* is to serve as a catalyst for homeowners to create demand for architects, designers, and builders to adopt the concepts and building practices that define human-centered, optimum-performance home design. *Ultimate Home Design* is aimed at broadening the segment of the American population that is paying closer attention to the products they buy, looking beyond price and branding to focus on other elements of the production and value chain. Increasingly homeowners want to support sustainable building practices that result in a higher living standard. *Ultimate Home Design* is for those homeowners who want to promote a broader shift in patterns of production and consumption by encouraging practices that better reflect their personal values. We are advocates for using products that reduce energy and use renewable, recycled content or otherwise environmentally preferable materials. An important part of our mission is to promote building practices that result in a substantial reduction in energy use for space conditioning, water heating, lighting, and appliance operation. Another important aspect of our mission is to promote construction practices that improve the indoor environment and reduce the risk of building-related illness. This translates to improved occupant health and comfort by improving thermal comfort; natural lighting and electric illumination; and controlling humidity, odor, noise, and vibration.

Ultimate Home Design is for the thinking homeowner, who wants to be educated and learn about intelligent options for home design, whole-house system design, and comprehensive electronic lifestyle features that can enrich the quality of day-to-day life while reducing the cost of operating a home. With the knowledge gained reading *Ultimate Home Design*, you will be empowered to make intelligent choices about the design and make-up of your home, whether considering remodels or additions, planning a new home, or evaluating an already-built home. *Ultimate Home Design* will explore the wide range of possibilities within the context of designing Optimum Performance Homes™ that integrate universal design architecture; sustainable green building materials and techniques; energy-efficient power systems for electricity, lighting, heating, and air conditioning; water conservation techniques; and comprehensive electronic lifestyle features.

Premiere Issue And Back Issues: Issue 1 (Jan/Feb 2006)
Available back issues are in limited quantities and can be viewed online at www.UltimateHomeDesign.com

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E-mail news submissions to: **Gary@UltimateHomeDesign.com**. Direct all press releases, announcements, news, and calendar events to that e-mail address or send to the Temecula Office. Writers, both freelance and industry-supported, are invited to contact the publisher to discuss article submittals. Completed Optimum Performance Home™ project submittals for publication consideration are welcome. Manufacturers are invited to submit product releases that support the mission of the magazine.

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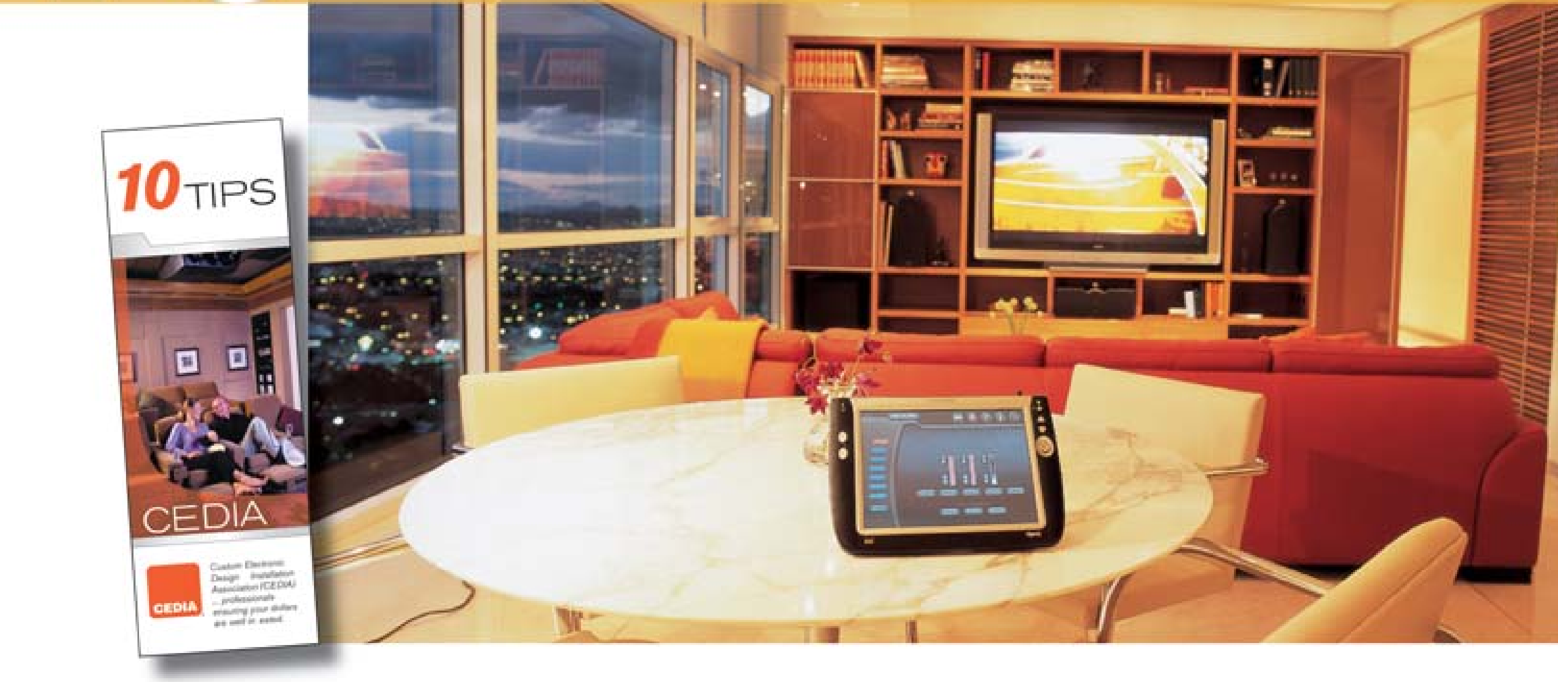
10 Smart consumer electronic tips for the home environment



1 **Wire for everything now** – If you are building or remodeling your home, wire it with a plan for future needs. While no one can guarantee what the future will look like, CEDIA Professionals make it their business to stay current to offer good advice about technologies that are on the horizon. Best of all they can help you sort out the hype from the reality.

2 **Plan for HDTV now** – High Definition TV is the new digital standard for enhanced picture quality for TV broadcasting. If you're buying a new TV or video projector, make sure you'll be able to enjoy the incredible sound and pictures that are part of HDTV.

3 **Insist on integrated systems** – As you buy new electronic components, make sure you shop for equipment that can be hooked up together and operated with one, easy to use control system.

4 **Don't buy yesterday's products (often what is in stock)** – Many stores purchase large orders of all equipment and sell it at discounted rates. Shop with a dealer that only provides you with new equipment and technologies.

5 **Consider integrating lighting control with your home electronics system** – Lighting sets the mood for home theater, entertaining, or just a quiet night at home. You can control your home lighting from the same remote that you use to control your theater or music system.

6 **Think with your wallet, but lead with your head** – Quality and long-term dependability are the most cost effective attributes that you can build into a home.

7 **Buy an experience, not a box** – Find a dealer that allows you to test drive the entire system or at least experience the thrill of a high performance system. Few people have the time to research and evaluate all the hardware choices. It's smarter to focus on the end result and make your choices based upon overall performance and value.

8 **Don't think you have to put up with hard to use, multiple remote controls** – Easy to use, all-in-one remote controls are available for any system. You can even have them custom programmed so they make perfect sense to you.

9 **Consult a professional** – Designing and installing reliable, easy to use systems that add real quality to your lifestyle is the goal of CEDIA professionals. Check to see if the company you're considering has CEDIA Certified Professional Designers and Installers on staff.

10 **Increase your service expectations** – Your home electronics system is a big investment. CEDIA professionals will provide you with extensive options, comprehensive designs, complete installation and especially, in-home service for your systems.

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WELCOME HOME
January/February, 2006

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Welcome To "Ultimate Home Design™"

Welcome to the Premiere Issue of *Ultimate Home Design*™, a new magazine that is intended to serve as a design and build resource for environmentally enhanced lifespan living. The magazine embraces the "Ultimate Home Design™" concept, which recognizes, respects, values, and attempts to accommodate the broadest possible spectrum of human abilities, regardless of age, ability, or physical stature, in the ergonomic design of products and environments that are easier to use and more aesthetically appealing, while optimally integrating sustainable green building practices and minimizing the overall impact on the natural environment.

Our Focus

The magazine's focus is to educate homeowners on leading-edge approaches to human-centered, optimum-performance home design, which embrace the latest developments in:

- Fully accessible lifespan architecture and universal design, without physical barriers, to accommodate all ages and all human capabilities and to meet "baby-boomer" and aging population demands for independent living and productive and sustainable lifestyles
- Environmentally protective and sustainable green build practices
- Watershed-based integrated runoff and groundwater planning and conservation, renewable water features, and rainwater harvesting
- Indigenous vegetation landscape planning
- LEED® for Homes-certified homes
- ENERGY STAR® Homes
- ENERGY STAR-efficient appliances and electronics
- Energy-efficient HVAC comfort
- Radiant heating, PEX plumbing, fire sprinkler protection, and intensive use of water conservation fixtures
- Building envelopes that are well insulated and ensure a non-toxic and healthier interior environment that is well ventilated
- Energy-efficient passive solar design
- Solar-powered electricity and hot water
- Wind-powered electricity
- Geothermal heating
- Zero Energy Homes (ZEH) operational efficiency
- Comprehensive electronic lifestyle features for whole-house control of room-to-room entertainment, lighting, security, fire protection, and technology-enabled healthcare products and services that meet the health and sustainable lifestyle needs of our aging population

Our Readership

Ultimate Home Design is aimed at forward-looking homeowners, architects, designers, and builders who want to understand the home system choices available to them to design homes that optimize environmentally enhanced lifespan living.

More and more homeowners are taking an active interest in responsible, sustainable, and ergonomic home building. Our readers actively engage in research to specify the smart features they desire in their homes. They drive direct sales and generate pull-through sales of materials, products, and services by influencing the builders, architects, and designers they work with in designing a custom home, targeting a tract home, or remodeling an existing home that meets their personal requirements and needs. Our readers want to be educated about the materials, systems, and technologies that will provide optimum performance and then work with an architect, designer, or builder to have their "dream" home built to their specifications. They prefer to make their own decisions about their home projects and are enthusiastic about specifying green build practices, energy-efficient products, alternative materials and build technologies, and universal design features. They also are willing to pay more for "green products" that enable them to feel as if they are personally doing something to safeguard Mother Earth and build a better future environment. Through *Ultimate Home Design*, these smart homeowners can become further educated on how to design and build better "Optimum Performance Homes™" that are

Sanus reinvents style in your own home with new Java furniture. Exotic hardwood in a luscious espresso finish, with the added contemporary flair of extruded aluminum and fluted glass, creates the newest tide in contemporary décor. As with all Sanus furniture, the Java line is built with unique A/V features such as extra-deep shelving, large wire channels and removable back panels. Features that set Sanus furniture apart from the crowd...like an escape to a secluded tropical isle.

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more functional, more economical, more comfortable, and more beautiful.

Architects, engineers, contractors, designers, and developers will also benefit by using *Ultimate Home Design* as a resource for understanding the numerous facets entailed in designing and building Optimum Performance Homes. With home technology and building science systems steadily becoming more complex, the magazine provides a means to stay current on such matters that are important to homeowners who want to build smarter.

Our Mission

The mission of *Ultimate Home Design* is to serve as a catalyst for homeowners to create demand for architects, designers, and builders to adopt the concepts and building practices that define human-centered, optimum-performance home design. The magazine is very unique in this respect.

Ultimate Home Design is aimed at broadening the segment of the American population that is paying closer attention to the products they buy, looking beyond price and branding to focus on other elements of the production and value chain. Readers of the magazine are increasingly becoming aware of the choices they have with respect to green building materials and products, energy-efficient building practices, and techniques that conserve precious water resources. As with the surge in demand for organic and natural food products because of people wanting to support organic and otherwise sustainable farming practices, increasingly homeowners want to support sustainable building practices that result in a higher living standard. *Ultimate Home Design* is for those homeowners who want to promote a broader shift in patterns of production and consumption by encouraging practices that better reflect their personal values.

We are advocates for using products that reduce energy and use renewable, recycled content or otherwise environmentally preferable materials. An important part of our mission is to promote building practices that result in a substantial reduction in energy use for space conditioning, water heating, lighting, and electronics and appliance operation.

Another important aspect of our mission is to promote construction practices that improve the indoor environment and reduce the risk of building-related illness. This translates to occupant comfort by improving air quality, thermal comfort, natural lighting and electrical illumination, and controlling humidity, odor, noise, and vibration. Such measures improve occupant health.

Ultimate Home Design is for the thinking homeowner, who wants to be educated and learn about intelligent options for home design, whole-house system design, and comprehensive electronic lifestyle features that can enrich the quality of day-to-day life while reducing the cost of operating a home. With the knowledge gained by reading *Ultimate Home Design*, you will be empowered to make intelligent choices about the design and makeup of your home, whether considering remodels or additions, planning a new home, or evaluating an existing home. *Ultimate Home Design* will explore the wide range of possibilities within the context of designing Optimum Performance Homes that integrate universal design architecture, sustainable green building materials and techniques, water conservation techniques, energy-efficient power systems for electricity, lighting, heating and air conditioning, and comprehensive electronic lifestyle features.

Ultimate Home Design signals an important change that is taking place in the way homes are designed, built, and remodeled. Traditionally designed homes work well for young, able-bodied adults, but not so well for people who are injured, chronically ill, or simply aging. But with homes designed and built to accommodate change, people of all ages and abilities can enjoy an independent and satisfying life without having to move. This landmark magazine shows how such "age-friendly" homes are planned, built, and appointed, and how they can be attractive and distinctive architectural creations as well.

All About Options

Whether you're planning a new home or undertaking a small-scale remodeling project, *Ultimate Home Design* will inspire and inform you. It will force you to think about the broader issues of residential architecture, construction, and product design.

Ultimate Home Design sets a new standard in the field by providing design and construction options that you didn't know were possible or available such as:

- Choosing an appropriate site
- Designing accessible approaches, driveways, pathways, ramps, and entrances
- Selecting the hardware, appliances, and systems that work best for ALL people, regardless of their abilities or disabilities
- Designing better doors, windows, and stairways
- Building or remodeling kitchens and bathrooms
- Understanding accessibility goals and standards
- Creating a living environment that meets high expectations of aesthetics, function, and self-expression
- Designing indoor environments that improve occupant health
- Reducing home maintenance and promoting serviceability

EDITOR'S space

Feature Departments

Feature departments consist of:

- Editor's Space
- Breaking Ground (Trends, Legislation, Certification Programs, and News)
- Reader Feedback
- New To The Neighborhood (Manufacturers' Product Innovations Showcase)
- Certification Programs (In-Depth Articles)
- Universal Design (Applications and Projects)
- Environmentally Minded Landscaping (Applications and Projects)
- Green Building (Applications and Projects)
- LEED® For Homes (Home Showcases)
- ENERGY STAR® Homes
- ENERGY STAR® Appliances and Electronics (Manufacturers' Product Showcase)
- Energy Efficiency (Building Envelope, Lighting & Lighting Controls, HVAC Equipment and Systems, and Plug Loads)
- Water Conservation
- Environmental Interior Health (Applications)
- Efficient and Healthy HVAC (Applications)
- PEX Plumbing (Applications)
- Home Power Generation (Geothermal, Solar, and Wind Applications)
- Materials Recycling (Applications)
- Ultimate Home Architecture (From The Architect's Perspective)
- Electronic Lifestyles (Applications and Manufacturers' Product Showcase)
- Sustainable Lifestyles (Strategies For Aging With Style)
- On-Site Conversations (Interviews)

About The Publisher

The idea for the magazine was inspired during the time I, Founder and Publisher, spent designing the first Optimum Performance Home to be constructed at The Sea Ranch, California (see featured article). This home is one of two custom home projects in California to be accepted into the prestigious LEED for Homes (Leadership In Energy & Environmental Design) pilot project, the latest green building rating program initiated by the U.S. Green Building Council (USGBC).

Ultimate Home Design is published by Ultimate Home Design, Inc. The magazine shares offices with *Widescreen Review*®, a WSR Publishing, Inc. publication, also owned by my wife Marlene and me. *Widescreen Review* is internationally recognized as the premiere home theatre and home entertainment magazine featuring audio and video equipment reviews for optimum performance home theatres; HDTV, movie DVDs, and surround music reviews; and technology articles. I am President of both publishing companies, as well as Editor-In-Chief and Publisher.

UltimateHomeDesign.com is the dedicated Web site that serves as the official subscriber-supported Webzine for the Internet-based content and reference resources related to the print magazine. A comprehensive and in-depth searchable resource library will be a feature of the Web site, allowing the magazine's readership to locate materials and products that are in the scope of the magazine's context.

Ultimate Home Design is printed on elemental-chlorine-free paper made from 30 percent post-consumer waste.

A Service Inquiry Card will be provided in each issue for Free Information Requests via Business Reply Mail.

The staff, Marlene, and I thank you for supporting our new magazine. We have a lot to look forward to as we together journey down the path of exploring new environmentally responsible and smart home design concepts to enhance our lifestyles.

Inside This Issue

In this issue, we introduce you to articles largely written by some of our learned and respected Editorial Directors and this issue's Contributing Writers on the subjects of Optimum Performance Home Design, Universal Design, Green Building, Electronic Lifestyles, and Electronic Healthcare. The purpose of the magazine is to provide our readers with a responsible design philosophy with respect to the approach taken with the Optimum Performance Home design concept.

Wolfgang Preiser, Ph.D., crafts an article on the Principles of Universal Design in the broadest sense and how such principles can be applied to everyday living. Wolf argues that universal design is the paradigm for the 21st century.

Peter Giacalone further develops the idea of ultimate home design for the delivery of health-care services electronically.

Demian Martin presents the case for the connected home as an automated future that is here.

Andy Willcox discusses lifestyle solutions via custom home electronics from the CEDIA perspective.

Ann Edminister, M.Arch, and Jay Hall, PhD, provide an introduction to LEED for Homes, the U.S. Green Building Council's newest leadership in energy and environmental design rating system.

Jill Abelson provides an overview of the ENERGY STAR program and shows how to use ENERGY STAR to find products and homes with the most efficient, advanced, and smart design.

Scott Cronk introduces our readers to FindSolar.com, a new Web site for homeowners to find solar professionals.

The article on reclaimed wood flooring products is reprinted from the September/October 2005 issue of *Hardwood Floors*. Hardwood floors have come a long way over the past decades. There is a hardwood floor for every room of the home, including those places that wood has never gone before, and there are more choices, styles, and colors than ever before as can be seen in this article.

All flooring regardless of width or length that is one piece of wood from top to bottom is considered solid flooring. Solid floors can be almost any species or color available and can provide opportunities for customization. In most cases, solid wood flooring is nailed down on plywood. Engineered hardwood consists of a solid hardwood layer glued on top of a multiple layer plywood core. The engineered plywood core makes this type of product much more dimensionally stable than solid hardwood flooring. Engineered hardwood will usually be glued down to the sub-floor, but several of available brands can also be nailed-down, or installed in the "free-floating" method. Many different species and colors of engineered flooring are available on the market.

Finally, our featured article is the first in a series covering the design and building of the first Optimum Performance Home. The home site is located at The Sea Ranch, California. In the first article in the series, I cover the project scope including various design considerations such as sustainable lifestyles, universal design, electronic lifestyles, and green building.

Well, that is an awful lot of content for any one issue of a magazine, but I felt that it was important to set the stage in this Premiere Issue of *Ultimate Home Design* for what our focus will be in future issues.

Thank you again for your support, for without it we could not embark on this mission to explore how we can embrace environmentally responsible and smart home design concepts to enhance our lifestyles. UHD

Circle #07 In Advertisers' Index For Information

Dear Readers,

Regrettably, our resources do not permit us to individually reply to every letter we receive. We also are unable to spend time on the telephone addressing questions. This would represent an operational expense that would result in a significant service charge and time does not permit our engaging in such, although we do appreciate our readers' interest in and support of the magazine. Although all letters via all delivery means are read and noted, we cannot publish every letter in the magazine. Those of general interest that advance our understanding of the concept of *Ultimate Home Design* and Optimum Performance Homes are selected for publication. Those not published are considered for publication on our Web site at www.UltimateHomeDesign.com. Please note also that published letters are subject to editing, particularly if they are exceedingly long or address more than one topic. All correspondence should be addressed to the Editor-In-Chief, Gary Reber, and should include your name, complete address, a daytime telephone, and e-mail. Or, if you prefer, you may e-mail Gary@UltimateHomeDesign.com.

Thank you for your kind consideration and support.

Why Launch Another Magazine?

Dear Gary:

Why start another magazine? You have been publishing *Widescreen Review*® for 14 years, and from all accounts this is a well-respected home theatre magazine that reaches a national and international readership. I have been a subscriber since Issue 1. Shouldn't you be thinking of retirement?

Wendy Jones, Springboro, Ohio

Editor-In-Chief and Publisher Gary Reber Comments: Creating Ultimate Home Design™ *represents a long unfulfilled passion that I have for architecture, community planning, and lifespan sustainability through strengthening the individual, and staying creative and productive during all stages of life. As a young college student, I majored and degreed in architecture, community planning, and economic development planning and later was a partner in a consulting firm practicing these disciplines. My mission and purpose to educate and advocate is driven by a heart and soul connection to this new enterprise. I have always believed in the empowerment of individuals to create and build great businesses and produce great creations. As an empowered individual, I work a lot harder and more hours than ever before but feel totally fulfilled knowing that I am teaching others to appreciate the possibilities for enriching their lifestyles.*

Of course, making my career as a writer, editor, and publisher of magazines was never in my early career ambitions. But educating and advocacy were always dear to me and have been passions throughout my entire life. As a magazine editor and publisher, I have always endeavored to convey the subject matter in such a way that meaning, fulfillment, passion, and purpose would meld altogether. I have always embraced affirmation as a philosophy of life, and as a result I have always trusted that the unknown dots associated with any new endeavor would somehow connect in my future. This approach has never let me down.

Ultimate Home Design *is totally unique as a publication addressing a new paradigm in architecture and how it relates to independent living and sustainable lifestyles. With more people now 55 and older than people under 55, and a timeline nearing a point in 10 years where nearly 115 million Americans will be over the age of 65, I believe that architecture for the home needs to mature and nurture the possibilities for our aging population to enjoy lifestyles that will keep them connected to the work life that makes them happy. This means we need to adopt age-friendly home design to reduce stress and eliminate physical barriers that challenge us as we grow older. I believe that the home will become the center from which people will be able to find community and attract like-minded people through the unlimited possibilities facilitated by broadband Internet technologies. And fulfilling work is the perfect medicine for sustaining lifestyles as long as the work doesn't compromise your personal values and it makes you happy. The real key to fulfillment is to follow your interests and find something that inspires you. With age expectancy now at about 87 years and retirement at 65 or earlier, aging individuals can expect 20 to 25 years longer to enjoy life. By the age of 65, most people let go of their paychecks and are faced with the possibility of following their dreams. Not everyone will be able to live his or her dreams. But do not despair, as no one can preconceive what you or someone else can or can't do.*

Architects and builders, as a class, have neglected for centuries the natural course of lifecycles by designing and building dwellings that serve occupants who have a Peter Pan desire to stay young forever. As baby boomers reach retirement age, the realization will set in that their homes aren't optimized to sustain independent living.

As a generation often bent on irresponsible consumption, conspicuous spending, and the dire abuse of Mother Earth, guilt-ridden or simply concerned baby boomers will hopefully take comfort in supporting and demanding sustainable green building home design and construction. This, in itself, will result in a remarkable revolution in architecture. And over time Mother Earth will heal, and the promise of an unlimited source of sustainable resources will be the realization. We will have success when the words "sustainable design" are no longer in our vocabulary and the default is, in fact, sustainable design.

With Ultimate Home Design, *I hope to inspire homeowners, architects, designers, builders, and developers. The new magazine is intended to serve as a design and build resource for environmentally enhanced lifespan living. The magazine embraces the "Ultimate Home Design" concept, which recognizes, respects, values, and attempts to accommodate the broadest possible spectrum of human abilities, regardless of age, ability, or physical stature, in the ergonomic design of products and environments that are easier to use and more aesthetically appealing, while optimally integrating sustainable green building practices and minimizing the overall impact on the natural environment.*

I have no intention of "retiring" in the traditional sense, even though in three years I will be 65. Instead, the design of the first Optimum Performance Home™ to be constructed at The Sea Ranch, California is the thoughtful realization of a dream home for sustaining my continuing creativity and work ethic. My wife Marlene and I plan to operate and manage both Ultimate Home Design, Inc. and WSR Publishing, Inc. publishing companies from the home, as well as the educationally-themed annual cruises we co-produce through Home Theater Cruise, LLC. The home office and Reference Holosonic™ Spherical Surround™ Home Theatre Laboratory will be my working environment from which to work productively, with sophisticated electronics supporting communication and outreach to the world via the Internet. During my remaining productive years, I also plan on writing and publishing books, serving as an educator, and volunteering for community service.

I invite you to join us on our journey to enlighten ourselves and become good stewards of Mother Earth. All together we can make a positive difference. UHD

Circle #08 In Advertisers' Index For Information

More Boomers Want To Age-In-Place

Boomers are not interested in moving to traditional retirement communities. Many Boomers who have invested in their homes do not want to move just because they are older. Certified Aging-in-Place Specialists and reverse mortgages make home modifications easier for consumers.

Today older adults have more long-term housing choices. Instead of entering a long-term care facility, many older homeowners are investing in home modifications. This is an especially appealing idea for Boomers who would rather live in their homes. A recent study conducted by AARP found that although the majority of Boomers want to age-in-place they are not sure where to find specialists who can modify their homes. This is the reason the AARP and the National Association of Home Builders created the Certified Aging in Place Specialist (CAPS) program.

Boomers who need home modifications can hire a CAP specialist and be assured that their contractors are knowledgeable about the needs of aging clients. The CAPS process involves completing three courses: 1) Working with and Marketing to Older Adults 2) Home Modifications 3) Introduction to Business Management. Once a person receives the certification, he or she must take continuing education courses. The program is beneficial for those who want to include the often-missed aging population in their client base, and Boomers will be more confident about hiring a CAP specialist for their home modifications.

Modifications in the homes of Boomers will increase once they reach 62. This is the age that homeowners can apply for reverse mortgages. Using a reverse mortgage is one way to pay for necessary home modifications that will allow for aging-in-place. Homeowners retain ownership while using the equity of their homes to pay for necessary home modifications and other expenses.

The source for this article was "Remodelers Prepare For Boomers Who Opt To Age In Place" by Wayne Nelson, which appeared on BusinessNorth.com. UHD

Housing Options For Older Americans

Housing options are both abundant and fragmented as the growing need of older Americans to remain living independently becomes more recognized. The process of choosing and locating the suitable housing environment may be difficult without guidance or resources. The Administration on Aging (AoA) has a fact sheet that highlights the importance of an appropriate living arrangement as key to helping older adults remain independent. The fact sheet covers the background issue of supply and demand, as well as the critical components in deciding the best housing choice.

The AoA indicated that there is a strong demand for home modifications. As statistics show, out of all the households that have a senior citizen, nearly half express the need for home adaptations, but only half of this group state they have received the modifications they need. The fact sheet indicates that additional problems occur with growing longevity; older adults face life-altering events such as the death of a spouse, debilitating illness, or limited financial resources. Such situations often lead to dilemmas or hasty decision-making in the hope of finding quick resolve. Moreover, the constantly changing policies and housing options further increases difficulty in finding the right place or the right options.

Before any modifications to your home are carried out, the AoA suggests assessment on the living environment to determine whether home modification is practical or if relocation is a better option. Part of the fact sheet is a list of questions one needs answers to when choosing the appropriate living arrangement. These questions include:

- Does this arrangement provide a supportive environment for retaining maximum independence?
- Is it easy to move about in the home environment or can home modifications enhance continued mobility?
- Is there access to in-home and community services when and if needed?

To view the fact sheet, visit the Web site www.aoa.dhhs.gov/factsheets/housing.html UHD

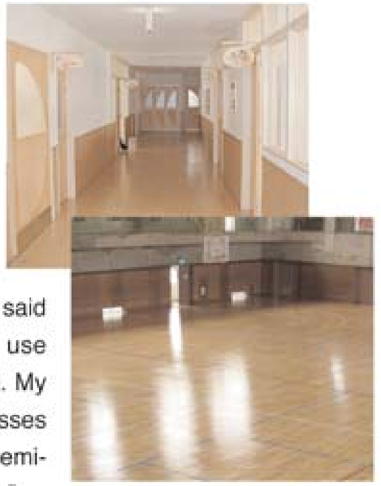
Glow In The Dark Objects Prevent Falls

Photo-luminescent products are being created as the demand for these products rises due to safety issues. Photo-luminescent materials provide a low-level glow that can be used to mark paths, and the technology for these products has improved in such a manner that they can now last for many hours. Conversely, the use of fluorescent lighting can prove to be dangerous, as people lose their ability to quickly acclimate themselves to darkened areas once the light is turned off. Thus, it is harder to see and safely negotiate their path. However, photo-luminescent lights are much safer as they assist in the person's ability to see important details in darkened areas. UHD

The AFM Family of Products
Building A Healthier World

What makes Safecoat paint so special? Here's a real world example: After construction at Sapporo Asahigaoka High School in Japan, several students reported symptoms of nausea, dizziness and headaches. School officials were baffled. Even though they specified so-called "environmental" building products, chemical offgassing was present in the classrooms, making students sick.

So they tested every zero voc paint on the market, and others, including Safecoat. As it turned out, the affected pupils reacted to all of these products except Safecoat, which was then used to repaint the school. The offgassing stopped, the school reopened, and Safecoat became the paint of choice for Sapporo prefecture schools. Since we started working with environmental medicine physicians in the early 1980's, our goal has been to make products safe enough even for people who are chemically sensitive, like the student whose mother said "the school has decided to use Safecoat and for that I'm grateful. My daughter has been attending classes without the fear of reacting to chemicals and is enjoying school again."



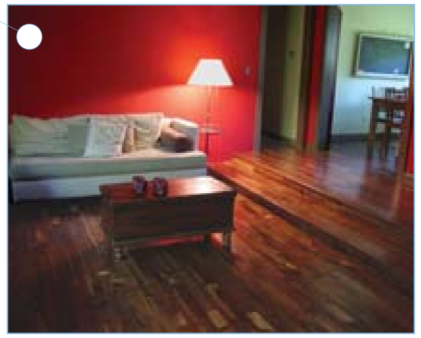
Visit our website for a list of authorized AFM dealers.
www.safecoatpaint.com

We don't just make paint! AFM provides many of the products you need to build, remodel or decorate a healthier home.

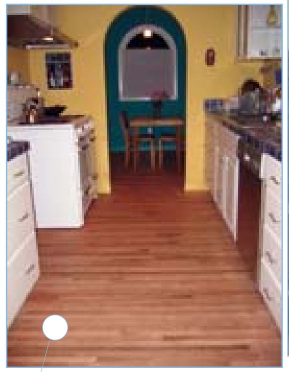
Circle #09 In Advertisers' Index For Information

New to the neighborhood

Sarah Scaglione



EcoTimber® As a member of the Forest Stewardship Council (FSC) EcoTimber has shown their dedication worldwide to forest conservation by selling sustainably-harvested and reclaimed wood products since 1992. They specialize in wood products from forests that are certified "well-managed" by the FSC. In addition to certified products, EcoTimber also offers wood that is reclaimed from old buildings and wood alternatives like bamboo. EcoTimber's engineered flooring boasts all of the benefits of laminated flooring, including stability and easy installation. They also offer reclaimed wood flooring remilled from tight-grained, old-growth lumber reclaimed from deconstructed buildings. EcoTimber exotic hardwoods are amazingly beautiful and using them is key to supporting sustainable forestry initiatives in the tropics where forests are quickly being depleted. EcoTimber's bamboo flooring is made from bamboo plantations and is a highly renewable resource. Its low-moisture properties make it ideal for humid climates and it is made with a low-VOC adhesive.
888 801 0855 www.ecotimber.com



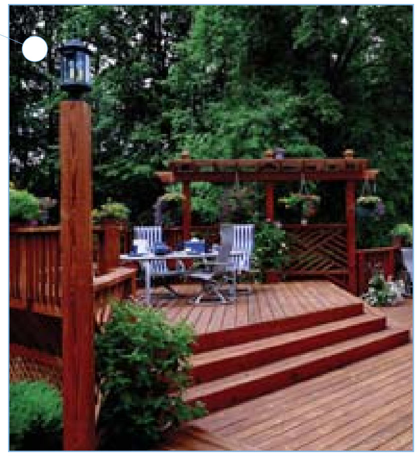
American Clay Surround yourself with artistic elegance with the Original Earth Plaster, American Clay. American Clay is a green formulation of clays and aggregates offering a natural finish for interior walls and ceilings. A natural alternative to cement, gypsum, acrylic, or lime plasters, American Clay products are applied like conventional plasters but offer no offgassing or inherent waste on-site. Clay naturally controls the interior climate by absorbing and releasing moisture in response to changes in the environment. This stunning plaster is also non-flammable, resists mold growth, absorbs sound, breathes with temperature and humidity, and is easily repairable. Available in three finishes and over 30 colors, American Clay is 100-percent natural. An instructional video is also available.
866 403 1634
www.americanclay.com

AFM Safe Coat has been providing a complete range of chemically-responsible building and maintenance products for years. They offer paints, stains, wood finishes, sealers, cleaners, and other building products for the environmentally-focused homeowner. AFM's new Naturals Oil Wax Finish is the natural solution for finishing wood and bamboo floors and other interior wood surfaces. It is made from sustainable, plant-based, organically produced ingredients that produce a clear and durable finish. Also available from AFM is their Naturals Clear Penetrating Oil that can be used to help rejuvenate, weatherproof, and enhance the beauty of decking, fencing, paneling, and trim. AFM has received several awards for their green and non-toxic products.
800 239 0321 www.afmsafecoat.com

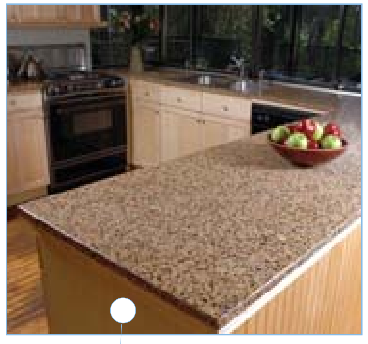
MTI Whirlpools introduces a serene approach to relax and renew-the Yubine. This Japanese-inspired soak tub, built for two, offers the fatigued homeowner a variety of luxurious options to unwind. The Yubine's signature Japanese contours measure 65-3/4 x 42 x 32 inches deep and are sleek in design. The Yubine allows customization of your divine experience by complementing your still water bath with a whirlpool or thermo-air massage. To further heighten your experience, the hand-crafted Yubine is also equipped with an integrated air diffusion system that provides true aromatherapy to be used with pure essential oils. Customize your Yubine with a wide variety of options and upgrades, including MTI's patented Fill-Flush® or Simple Touch® whirlpool cleaning system. Both systems thoroughly clean the internal plumbing system, in less than five minutes and with less than 10 gallons of water.
800 783 8827 www.mtiwhirlpools.com

PRODUCT showcase

Arch Wood Protection has introduced the latest addition to their Wolmanized wood collection called Wolmanized® Residential Outdoor® Wood, which is real wood treated with a patented preservative called copper azole. Copper azole is composed of recycled copper and an organic fungicide, which has also been used as a fungicide for fruits, peanuts, and other crops. This salubrious preservative is a natural protection against termites and most copper-tolerant fungi. This product is primarily used for decks, gazebos, walkways, landscaping, and other exposed projects. Wolmanized Residential Outdoor Wood, protected with copper azole, reduces demands on forest resources by providing wood with long-term resistance to its natural enemies. Since wolmanized wood is made from a renewable resource grown on managed timberlands, it requires less energy to produce than plastics and offers greater insulation value. This wood is also clean and odorless and can be painted or stained like ordinary wood. It is also available with built-in water repellent to minimize moisture damage.
770 801 6600 www.wolmanizedwood.com



Fire On Ice™ An ingenious Los Angeles, California-based company has introduced their competitive alternative to gas logs called IceFireKits™. This product boasts the ability to generate up to 600 percent more clean radiant heat than gas logs using one-third the energy. Packaged as "all-in-one" kits, Fire On Ice is the perfect conversation starter. The "ice," which is really glass, is available in many different colors to complement your existing decor. There is no soot or ash and the specially formulated glass burns cleanly and odorless without changing color. Once installed, this product yeilds a mesmerizing fire that appears to be dancing on glass.
800 610 9021
www.fireonice.com



EnviroGLAS® One man's trash is another man's treasure. EnviroGLAS Products, Inc., a Plano, Texas-based company, makes its mark by converting post-consumer and industrial glass, bound for the local landfill, into elegant, sustainable, and ecological hard surfaces and landscaping materials. The unique and affordable EnviroSLAB™ countertop slabs and EnviroPLANK™ floor tiles are custom manufactured with 100-percent recycled glass and color pigmented epoxy resin. EnviroSCAPE™ is the newest trend in eco-friendly decorative landscaping. To be used as landscaping mulch, in aquariums, or any place in lieu of sand. EnviroGLAS® Terrazzo is an odorless, zero VOC-producing, naturally bacteria-resistant flooring and hard surface system that requires only water, neutral pH cleanser, and buffing to maintain. This is the definitive solution to the air quality flooring and hard surface problem. This product is a stunning addition to any home.
888 523 7894 www.enviroglasproducts.com

Leviton Manufacturing Company introduces their new California Title-24-compliant Decora® Manual-ON Occupancy Sensor. This stylish and low-profile Decora Sensor monitors a room or area and automatically switches lights OFF after it senses the room is no longer occupied, allowing homeowners to reduce energy consumption and save on their electric bills. A segmented Fresnel lens provides optimum sensitivity and performance with an extensive "small motion" area where even slight body movements can be detected. The Decora Sensor allows the homeowner to maximize energy by allowing optional manual adjustment for delayed-OFF time settings. The new Sensor is installed in place of a single-pole wall switch and fits in a standard wall box. Its distinctive design complements any interior. Leviton's Decora Sensor is UL Listed, CSA Certified.
800 323 8920 www.leviton.com

Gravelpave^2 was developed by Invisible Structures, Inc. as a second option of porous pavement that would tolerate high-frequency and low-speed traffic. This cutting-edge product can be used for driveways, trails and paths, storage yards, and RV parking. The Gravelpave^2 structure is sold in large rolled mats to provide for fast installation. Simply fill the Gravelpave^2 mat with the gravel of your choosing. The result is a smooth, firm, and stable surface that can accommodate any tire, including wheelchairs. The porous finish also allows for the containment of storm water for redistribution to nearby plants and trees. Thus, there is considerable cost savings with reduced or eliminated drainage systems. Invisible Structures, Inc. contributes to the green market once again with Rainstore^3, a plastic structure used to store the caught storm water underground. Made from injection-molded plastic, this structure allows for the construction of driveways on top of the system.
800 233 1510
www.invisiblestructures.com

Delta Fireplace

RSF Wood Burning Fireplaces is a division of Industrial Chimney Company, and is devoted to manufacturing high-quality venting products for residential, commercial, and industrial markets. A cozy fire in an RSF wood-burning fireplace releases solar energy into your home. This creates a renewable source of energy, meaning it can be used over and over without depleting the earth. Using wood for heat equals less fossil fuels burned, less greenhouse gas emissions, and therefore, a healthier environment. These wood-burning fireplaces enable you to heat your home efficiently while also lowering the overall impact on the environment. The largest member of the RSF family is the Delta Fireplace, featuring a beautiful bay window that lets you enjoy the wondrous glow from every corner and every angle of the room.
450 565 6336 www.icc-rsf.com

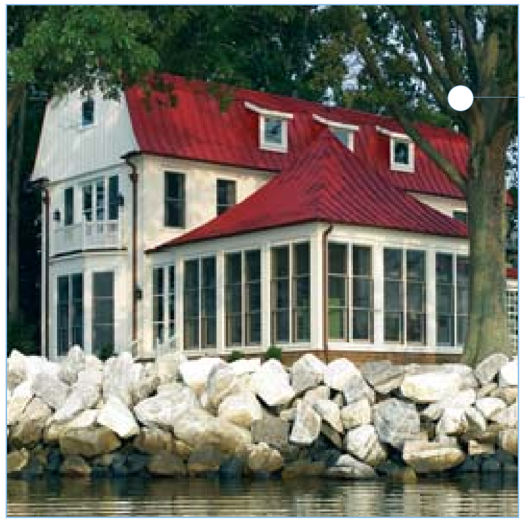
Pervious Concrete isn't a new concept but is one that is gaining popularity in the sustainable building market. This is a type of concrete that is manufactured without fine aggregate. This produces a product that allows storm water to pass through the concrete at incredibly high rates. With traditional concrete the water runs off the pavement into drains and swales, finding its way eventually to our streams and rivers. With pervious material, the water won't run off but will instead drain straight through the pavement to infiltrate groundwater. This reduces downstream pollution and erosion. Pervious concrete also does its part to contribute to the enhanced air quality by lowering atmospheric heating through lighter color and lower density.
888 846 7622
www.nrmca.org

Colorado vNet™ makes life simpler with their home automation solutions that pave the way for unlimited control of your environment. They offer a wide range of home automation control from lighting solutions to touchpads that control your home from the touch of a single button. Colorado vNet has now introduced a completely new way to wire and automate the home based on the system's modularity, scalability, and wiring. The Home Automation System, Touchpad (TP1-1D) on eCAT5 is extremely easy to install and operates without a central computer. The touchpads are sleek, stylish, and contemporary; and the company is dedicated to becoming the industry standard replacement for light switches, dimmers, and keypads. The touchpad buttons are operated with the single touch of your fingertip. A slight touch can switch the lights on and off, or can control your drapes, ceiling fans, and pool covers, etc. The customization of background graphics and button labels can be done in just minutes. Colorado vNet remains committed to providing premium intelligent solutions for whole-house automation and digital distributed audio solutions.
970 203 3700 www.coloradovnet.com

Leviton Manufacturing Company recently joined more than 125 industry professionals in the "Z Wave Alliance," which is a conglomerate of cutting-edge companies incorporating Z-Wave technology into their products. Z-Wave™ is a wireless RF-based communications technology allowing home control by transforming any stand-alone device into an intelligent networked device that can be controlled and monitored wirelessly. Utilizing Zensys' Z-Wave technology, Leviton introduces Vizia-RF™, the first dependable and affordable wireless lighting control system for the home. The Vizia-RF system includes digital switches and dimmers along with a full-function scene controller, zone-controller, appliance and lamp modules, and remote control. Users can easily expand the system's control functionality by adding products from other Z-Wave Alliance partners. The unit is also self-adjusting, so should an obstacle block the signal, the signal is automatically re-routed along an alternate path to reach the controlled device. Leviton's Vizia-RF Home Control system overcomes previous performance issues and the high cost of earlier generations of wireless home control systems.
800 323 8920 www.leviton.com

Furnature™ manufacturers an extensive line of mattresses, bedding, fabrics, and furniture engineered for individuals with multiple chemical sensitivities and/or individuals committed to creating a healthier indoor environment. Their products are produced with only organically-grown cotton, pure-bred wool, and natural rubber. Traditional bedding contains synthetic materials that contain chemicals such as formaldehyde and arsenic. These offgas throughout their lifetime, exposing harmful vapors. Furnature uses only organically-grown cotton where no synthetic chemicals or pesticides are used. Their wool comes exclusively from an island off the coast of Holland where the wool is harvested from a sustainable source without detriment or harm to the sheep. Natural rubber, a renewable resource, is also used for production of their mattresses.
800 326 4895 www.furnature.com

Nature's Acoustics introduces Whisper Wool™, the premium acoustic underlay. Whisper Wool is a floor underlay made from 100-percent sheep wool for laminate, engineered, and hardwood floor applications. Wool fiber is extremely resilient and exudes lifetime durability. This inventive underlay prevents sound transmission through floors and walls and provides a moisture barrier that prevents condensation. As a yearly renewable resource, it is non-flammable and absorbs VOC's and formaldehyde off-gasing. Nature's Acoustics also incorporates a branded antimicrobial into their Whisper Wool to prevent mold, bacteria, and fungus growth. This is a true high-performance product from "nature" to you.
706 422 8660 www.naturesacoustics.com



Follansbee® Steel
Follansbee's innovations have taken the old classic tin roof to new heights of performance and longevity. They have developed an alloy, ZT® (zinc/tin), that provides unsurpassed corrosion resistance, which results in a roof that can reasonably be expected to endure 50, 80, or even 100 years. This patented zinc/tin alloy is then painted with solar reflective paint coating. Follansbee now offers KlassicKolors®, which is a pre-painted Terne II® zinc/tin-coated roofing sheet available in an extensive array of hues. KlassicKolors produce a low sheen that gives any home that traditional look, which makes the product ideal for both new and existing projects.
800 624 6906 www.follansbeeroofing.com UHD

The First Optimum Performance Home™

project scope part one

Gary Reber

Introduction

The first Optimum Performance Home™ will be built at The Sea Ranch, located in Sonoma County along the Northern California coastline of the Pacific Ocean. The showcase project is exemplary of the "Ultimate Home Design™" concept, which integrates universal design with the best sustainable building practices while exerting minimal impact on the environment. A building science systems approach to home building is the cornerstone of the project with emphasis on the relationships between the home's components and its environment. Also paramount is good stewardship—proper regard and respect for the rights of neighboring homeowners and the surrounding natural environment. The goal is to optimize occupant health, comfort, and safety; maximize energy efficiency and structural durability; and minimize environmental impact. As well, the goal is to provide a nurturing home environment to support independent living and sustainable lifestyles.

Synopsis

- Project scope entails embracing an integrated design process with the design team.
- "Ultimate Home Design" concept recognizes, respects, values, and attempts to accommodate the broadest possible spectrum of human abilities, regardless of age or physical stature.
- One of two custom homes in California to be accepted into the green building LEED® for Homes pilot program.

"The goal is to optimize occupant health, comfort, and safety; maximize energy efficiency and structural durability and minimize environmental impact...[and] provide a nurturing home environment to support independent living and sustainable lifestyles."

California Highway 1 coastal route to The Sea Ranch driving north. Two other routes provide access, one from the north on Highway 1 and one exiting Highway 101 and driving directly west through forest and vineyards.

The home design integrates all of the concepts advocated in *Ultimate Home Design*™. I conceived the "Optimum Performance Home" and "Ultimate Home Design" concepts, and had a vested interest as this would not only be my home but my office as well. My goal was to demonstrate how today's products and building methods can make life safer, more comfortable, and more enjoyable. The science of optimum performance homes is about building structures that use less energy, are quieter and more comfortable, have fewer decay problems, provide clean air and water, and do less damage to the environment. As an integrated holistic design, the house will serve as a home for many people and serve in many phases in one's life.

Ed Rose, of Rosebud Studios in Monte Rio, California, is the implementing architectural designer. Ed masterfully made the preliminary and final construction plan designs work within the requirements, restrictions, rules, and guidelines imposed by the Design Committee of The Sea Ranch Association.

Bill Wilson, Environmental Planning & Design, LLC in Mill Valley, California, is the environmental designer/engineer who designed the environmental aspects of the home and the site's conservative renewable water features.

Both were challenged by the scope of the home design but approached this project with enthusiasm and skillfulness.

Susan Mack of Homes For Easy Living, a Certified Aging In Place Specialist (CAPS) and occupational therapist based in Murrieta, California, provided refinements for the universal design features in the home.

I, having a university education in architecture, community planning, and economic development planning and a past consultant, provided the vision and headed the design team through every stage.

A spectacular portion of the rugged Pacific Ocean coastline at The Sea Ranch

A view of The Sea Ranch looking south with the Golf Links 18-hole golf course in the foreground.

Gary Spierings of Dimensions 4 Engineering, Inc. based in Santa Rosa, California, provided the septic system engineering. Keith Colorado of Bace Geotechnical in Santa Rosa performed the site soils analysis. Daniel Del Carle, also based in Santa Rosa, served as the structural engineer on the project.

Ronald Devesa, an architectural illustrator based in Santa Rosa, provided the architectural illustrations for the project.

The Sea Ranch Design Committee, whose Director of Design Review is Richard Whitaker, oversaw the project from the conceptual to the final construction plan stages.

An integrated design process was embraced, which involved myself, my wife Marlene, and the entire design team in discussions and decision-making from the earliest stages of the project. This dynamic approach fostered communication and innovation and encouraged productivity, creativity, efficiency, participation, and commitment from each member of the team. The project thus benefited from a shared and consistent vision of opportunities and constraints, full systems analysis and integration, cost effective decisions, and shared information and education.

From the initial site review with Richard Whitaker, the home design and review process has taken three years. Construction is expected to begin in February 2006 and be completed by early 2007.

The home is one of two custom home projects in California to be accepted into the LEED® for Homes (Leadership In Energy & Environmental Design) pilot program. LEED for Homes is the newest green building rating program initiative of the U.S. Green Building Council (USGBC).

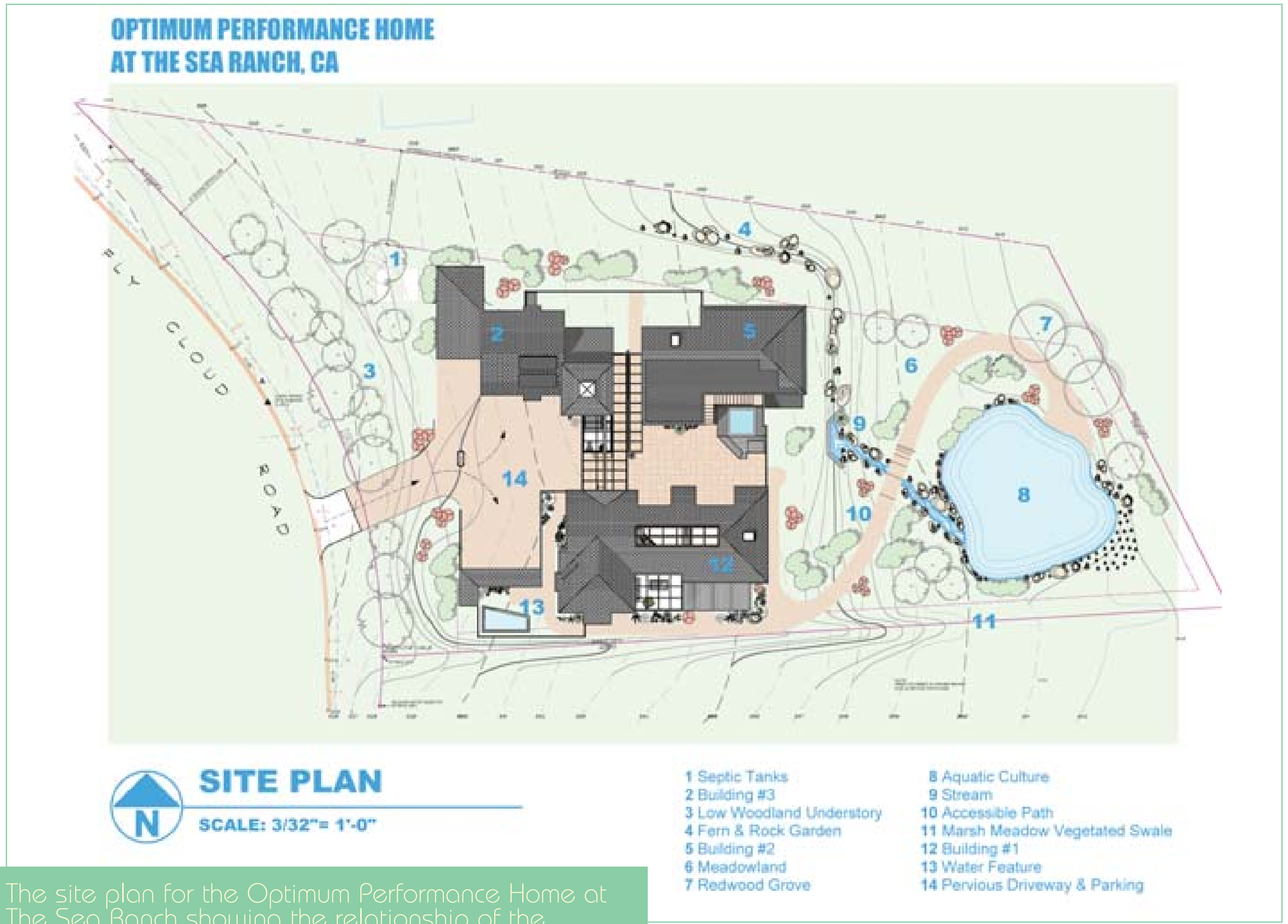
The Sea Ranch

The Sea Ranch is an internationally known 5,000-acre residential development situated within a pastoral coastal enclave and nature preserve about 100 miles north of San Francisco. This stunning development, now celebrating its 40th anniversary, straddles a 10-mile stretch of Highway 1 ending at the northern tip of Sonoma County and the south bank of the Gualala River.

The Sea Ranch project location is widely regarded as a unique and remarkable residential development. The development was conceived and designed by architects and landscape architects and provides a harmonious mixture of custom homes and pristine natural Northern California landscape in oceanfront, meadow, and forest environments. In fact, The Sea Ranch concept and its architecture are recognized in schools of architecture around the world. Indeed, architectural schools frequently use The Sea Ranch for case studies in environmental and architectural design. Single-family development occupies 2,500 acres with no fence delineation of property lines. The remaining 2,500 acres are permanent greenscape commons and trails for walkers, bicyclists, and equestrians. Each home is custom designed by an architect/designer following site-specific design guidelines and situated off a private road network without curbs, sidewalks, or streetlights. The Sea Ranch is a very unique residential development with a tapestry woven among buildings and nature, with a sense of environmental preservation. The development encompasses 2,289 lots for single-family custom homes, with 584 remaining to be developed (1,705 already developed). The Sea Ranch is managed by The Sea Ranch Association, a Community Interest Development, and supported with numerous volunteer committees.

The Home

The home's 3,200 square feet living space (4,500 square feet including garages, covered walkways, courtyard, and decks) will be arranged in a three-building compound using a well-sealed, well-insulated, super-tight building envelope that reduces temperature fluctuations and enhances overall energy efficiency. The home is designed with differing spatial experiences throughout to encourage exploration. The home will display innovative interior design and be furnished in a contemporary Frank Lloyd Wright style appropriate to its dimensions. The home



The site plan for the Optimum Performance Home at The Sea Ranch showing the relationship of the three-building compound to the site

design connects the indoors and the outdoors with covered walkways, a courtyard, decks, and a garden to expand livable space, without requiring heating or air-conditioning. There is abundant and excellent use of natural light and natural indigenous landscaping planned.

The main floor living area is designed to accommodate the capabilities of all occupants without any challenging physical barriers, even for the elderly and disabled. The home design features a ground-level, open plan for the living room, dining room, master bedroom suite, and spacious kitchen with solarium, exhibition cooktops, and home management system.

The second building in the compound is designed to accommodate a large state-of-the-art Optimum Performance Home Theatre™ with integrated rear-screen projection room and a home office.

The third building will include a two-car and boat garage, workshop, main level guest bathroom, and laundry room. The second level of this building will have two guest bedrooms, a bathroom, and a dedicated study/library/surround music room distinguished by a high-tower feature. To insure universal access to this floor, the design provides for a future elevator, should this be required.

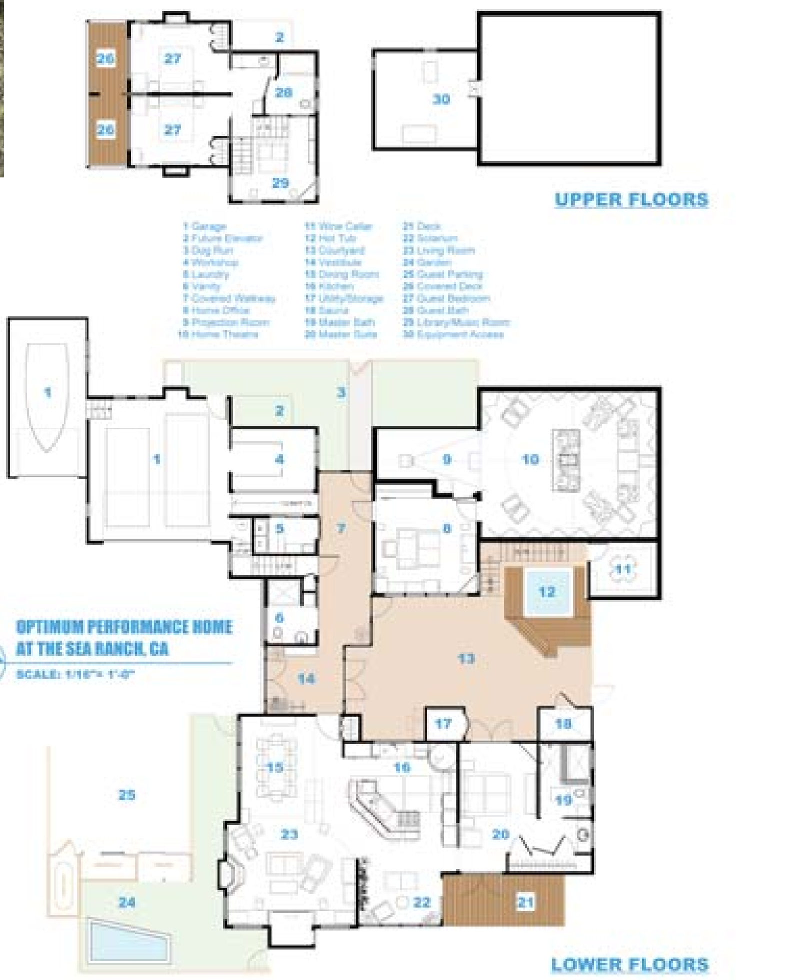
The entrance and walkways that connect the three buildings and the solarium will be enclosed with insulated- and solar gain-reduced-glass. There will be a floor sink and seating area at the vestibule entrance to the home. The main entrance vestibule will serve as an oversized mudroom. The driveway, area around the garage, guest parking, and entrance to the home, as well as all paths are designed in accordance with The Sea Ranch's guidelines governing exterior hard-surfaced paths. All such surfaces are pervious to virtually eliminate water runoff. There also will be a dedicated utility room off the courtyard, which accommodates the radiant heating apparatus. The backup generator will be located behind the garage within the fenced dog run in a separate weather-resistant enclosure.

The home site is nestled on an almost-acre parcel at the edge of a forested area of The Sea Ranch overlooking the Pacific Ocean, offering distant water views. Some of the home's features will include a slate-floor center courtyard, two hardwood deck areas, in-ground hot tub, Finnish sauna, and underground wine cellar. The orientation of the home on the site is designed to take advantage of natural lighting and passive solar heating and cooling. Good site and land planning

An architectural illustration by Ronald Devesa depicting the home's shapes and spaces situated on the site

An architectural illustration by Ronald Devesa depicting one view of the home from the road

The floor plan of the Optimum Performance Home delineating the three-building compound arrangement and covered walkways

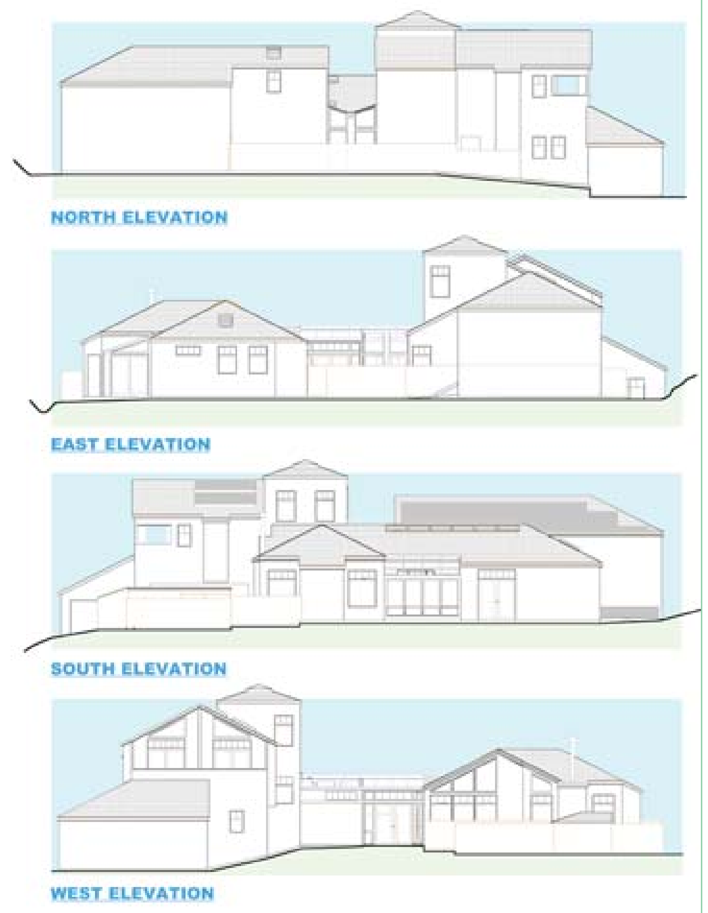


results in minimal land disturbance and preserves natural features and environments.

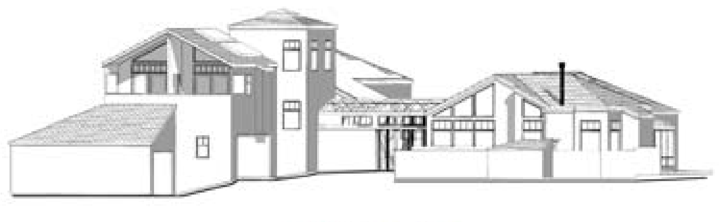
Landscaping will consist of The Sea Ranch-approved indigenous vegetation with low-water requirements and unique water conservation features, including two ponds and a stream supported by rainwater catchment and captured runoff. Site grading has been specifically planned to enhance the project's placement in the watershed, and the design incorporates the principles of Low Impact Development (LID) to minimize runoff from impervious surfaces and mimic the natural hydrology in overall effect. The resultant water harvesting will then minimize the use of irrigation, and the increased infiltration and retention will passively support the native landscape.

Ultimate Home Design Concept

The Sea Ranch Optimum Performance Home embraces the "Ultimate Home Design" concept, which recognizes, respects, values, and attempts to accommodate the broadest possible spectrum of human abilities, regardless of age or physical



The elevations of the Optimum Performance Home at The Sea Ranch



SOUTHWEST VIEW

Above: A perspective of the southwest view created by architectural designer Ed Rose.
Opposite Page: Four perspective views of the Optimum Performance Home at The Sea Ranch

stature, in the ergonomic design of products and environments that are easier to use and more aesthetically appealing, while optimally integrating sustainable green building practices and minimizing the overall impact on the natural environment.

The design and integration of the home supports a more inclusive user-based design because it takes into account the abilities and needs of the widest range of people. The human-centered design expresses a more holistic view of lifespan and people's changing abilities throughout their lives. While there are two guest bedrooms and a study/library/surround music room on a second level planned, the main occupant living area—home theatre and office, master bedroom suite, laundry room, workshop, and garages—are all to be located at ground level with accessible provisions aesthetically disguised in the architecture with no step or bump barriers to inhibit maneuverability. Entering the three-building compound through the entry vestibule will be on-grade with no access barriers or steps from the outside making the home fully "visitable." This "age-friendly" home will accommodate family members at all stages of life, from infants to grandparents, all of whom benefit from a home that imposes fewer restrictions on daily activities and maximizes independence and safety.

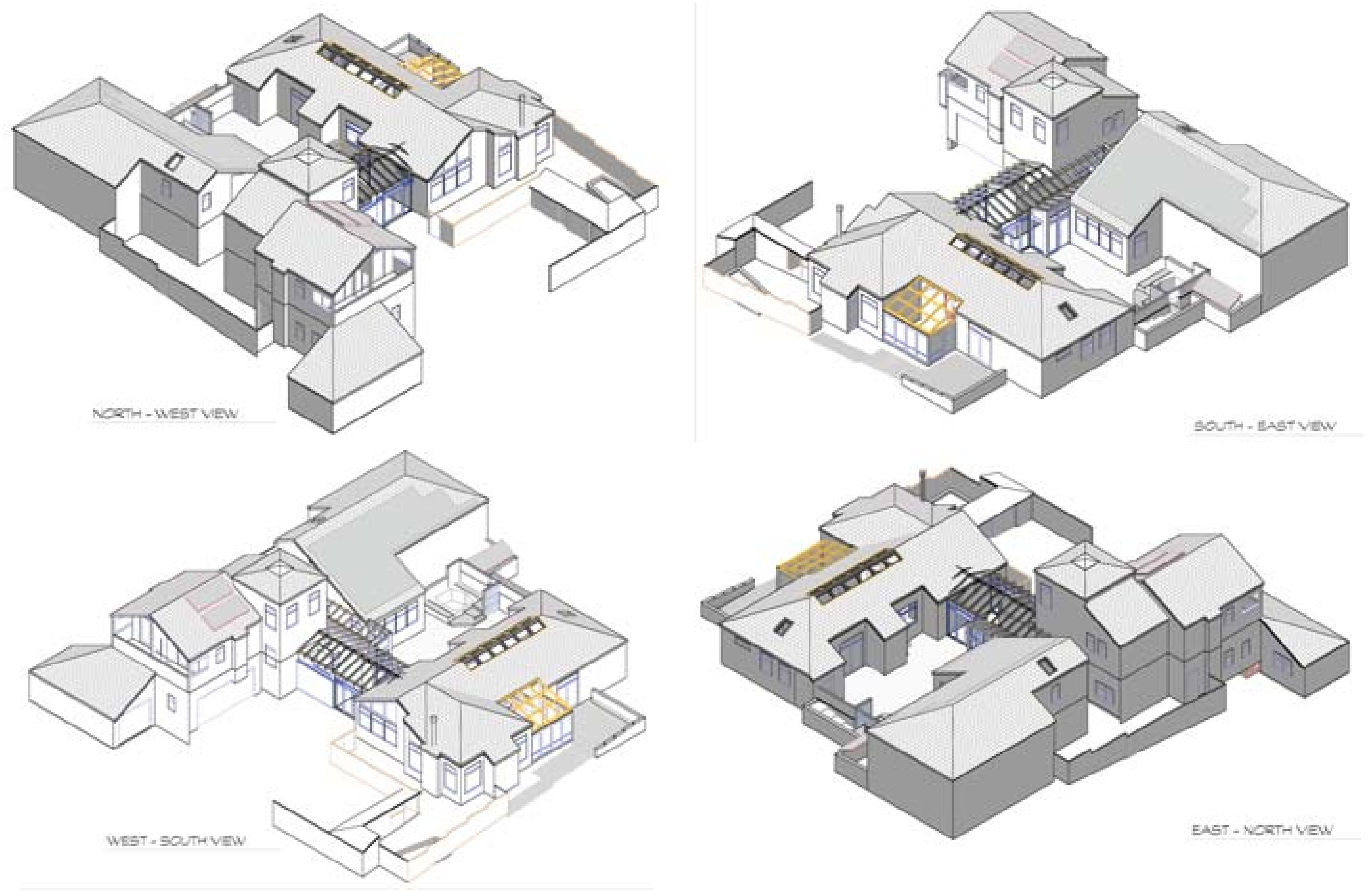
The method of green building to be used in the home incorporates environmental considerations into every phase of the home building process. That means that during the design, construction and operation of the home, energy and water efficiency, lot development, resource efficient building design and materials, indoor environmental quality, material durability and homeowner maintenance, and the home's overall impact on the environment are all taken into account.

The home will feature extensive green building techniques, which include water efficiency through gray water recycling and rainwater harvesting; using renewable or recycled-content building materials; preserving natural indigenous vegetation; conserving natural resources; improving indoor air quality and reducing pollution; lighting naturally; reducing home maintenance and enhancing durability; and recycling construction and demolition waste.

Even the heating system for the home is designed to be energy-efficient. A zoned radiant floor heating system will turn the entire first and second floors into primary, low-temperature heat sources that deliver radiant energy evenly across each room to its occupants and surrounding objects, but not the ambient air, resulting in a significantly healthier interior environment. The smoke alarm, PEX plumbing, and fire sprinkler systems will be integrated into the home's electronic control of lighting and sound to optimize inhabitant safety.

Smart Home Features

The entire home will support a live-work scenario with an infrastructure of advanced broadband hard-wired and wireless Wi-Fi and Local Area Network (LAN) systems that facilitate home networking room-to-room and out-to-the-world-at-large through the Internet. A comprehensive whole-house structured wiring system will be incorporated for distribution and control of audio, video, phones, videoconferencing,



intercoms, and computers. Stand-alone multi-room, multi-source/multi-zone studio-quality multichannel audio and high-definition video distribution systems will be featured throughout the home, operated by zone-controlled in-wall keypads and LCD touch panels. The system will integrate with Microsoft's Windows® Media Center and is future-expandable over CAT6 using an Ethernet network. Core product areas will include multi-room/multi-source controllers, distribution amplifiers, in-ceiling/in-wall/on-wall loudspeakers, infrared distribution systems, and user interfaces. A large dedicated state-of-the-art Optimum Performance Home Theatre, video game, and surround music room will be a special feature of the home, as well as a dedicated stereo surround high-end audiophile system free-standing in the study/library/surround music room. There will also be home theatre systems in the living room, the home office, and all of the bedrooms. All wiring will be concealed in the architecture through conduit and the use of wiring channels beneath the floors and within the wallboards. There will even be a whole-house security system that uses remote-monitored inconspicuous infrared video cameras. Other smart home features will include any-room control of all of the lights and lighting schemes, and electronic-controlled window shades and blinds.

Zero Energy Home

The home is designed as a "Zero Energy Home" (ZED) based on the Solar Buildings Program of the U.S. Department of Energy. The energy-saving home will feature a 5.7-kilowatt solar electric system with photovoltaic (PV) panels integrated into the roof. Inverters will convert the DC power into AC power. Hot water will be provided by solar collectors on the roof, boosted when needed by efficient, tankless water heaters. The home is designed to cut its energy use with efficiency, and then meet the remaining needs with renewable energy sources. Net metering allows the electric meter to spin backward and forward, meaning that at times the home will pull (and pay for) power from the grid and at others it will produce more energy than it will need, with the excess being sold to the electric company, resulting in an annual net-zero energy cost. It is expected that the home will generate more electricity than it uses. The system also is designed to continue functioning even during blackouts.

LEED® For Homes Pilot Program

The growing interest in sustainable building design and construction, and energy efficiency and environmental conscientiousness, now in the initial stages of understanding as it relates to building performance and the environment, has seeded a number of green building rating systems

whose initial focus has been on commercial and multi-residential buildings. The goal of these systems is to reduce the impact a building has on the environment by encouraging energy-efficient, environmentally responsible choices in the design and build process.

The LEED for Homes program is an example of a rating system for single-family residential buildings with the most stringent rating criteria. LEED (Leadership In Energy & Environmental Design) is a program of the U.S. Green Building Council (USGBC), a national non-profit organization. LEED Providers are local and regional organizations that provide support services to builders of LEED Homes and verify that homes built under the Rating System meet the requirements. Based on a model pioneered by the Residential Energy Services Network (RESNET) for home energy ratings, the LEED for Homes Program Providers will play a crucial role in the delivery of the LEED for Homes Rating System. The LEED for Homes pilot program, which follows the successful LEED for New Construction (LEED-NC) program, was formally announced in mid-July 2005 with the fully-chartered program to begin in early 2007.

The Sea Ranch Optimum Performance Home is one of two custom home projects in California to be accepted into the LEED for Homes pilot program. The home fully embraces the green building practices advocated by LEED. In order for the Optimum Performance Home project to qualify, the home must meet certain performance tests. When all of the required features have been verified by a third party, a LEED for Homes rating certificate will be issued. The certificate will distinguish the home as a bona fide green home.

For more information, visit www.usgbc.org/leed/homes or e-mail leedinfo@usgbc.org.

Integrated Design

While there have been homes designed with one or two of the concepts described above, there has never been a home, that I or our design team are aware of, whose design integrates so many leading-edge concepts and technologies. This is an integrated design that achieves a truly high-performance building and provides for safety, comfort, fire protection, security, aesthetics, buildability, environmental design, and acoustics, along with efficient energy use and resource efficiency.

The Optimum Performance Home at The Sea Ranch will be featured in *Ultimate Home Design* in a series of articles that will cover the various stages in the building process and serve the educational purposes of the magazine. It will also be featured in other magazines and media.

The following sections of this article describes the design concepts and approaches represented in the design of the home.

Summary

We hope that our Optimum Performance Home will serve as an exemplary prototype to encourage architects, designers, builders, and developers to adopt similar design principles. Such home designs as ours embrace a new dynamic philosophy of home design that meets the needs of people of all ages and all abilities while adopting building practices that promote independent living and environmental and lifestyle sustainability.

Over the course of several issues of *Ultimate Home Design*, the various construction stages with descriptions of the building materials and their application will be featured. As well, a multi-episode high-definition video documentary is in development and will be made available to our readers.

Members of our design team will have featured articles in future issues of *Ultimate Home Design* related to the Optimum Performance Home. UHD

The First Optimum Performance Home™

sustainable lifestyle

Synopsis

➢ **Personal requirements and needs should dictate the rooms and spaces to accommodate activities designed for sustainable and independent living.**

Introduction

The Optimum Performance Home at The Sea Ranch is designed to support and stimulate the lifestyle of Marlene and I. We are among those seniors who plan to relocate for retirement and "age-in-place" in a different area than we now live. And we are determined to age independently and successfully.

The pristine oceanside development called The Sea Ranch has been a decades-long desire for the site of our ultimate dream home. The Sea Ranch is a community of supportive neighbors and a place of exemplary Northern California natural environmental beauty, with 2,500 acres of the 5,000-acre development a permanent nature preserve (www/tsra.org). There are miles of walking trails, gardens, horse stables and riding trails; three recreational facilities with heated swimming pools, tennis courts and saunas; a community center; community garden; Golf Links, an 18-hole Scottish-link style golf course; nine separate beaches; and 10 miles of rugged coastline where the Redwoods meet the Pacific Ocean.

DESIGN
optimum performance home

There are three driving routes one can take to The Sea Ranch. The coastal route is the most beautiful and spectacular. The Sea Ranch also has a private air strip for small aircraft accommodations. Furthermore, The Sea Ranch is located within not more than a couple of hours drive from the beautiful Napa Valley, Alexander Valley, and Sonoma wine producing regions. Mendocino is less than an hour's drive north along the Pacific Ocean coastline, and Jenner, at the mouth of the Russian River, and Bodega Bay are about a half-hour to three-quarters-hour south along the coast.

Our idea has always been to build our dream home so that as we grow older the home can be adapted to fit our changing needs and allow us to remain in our home for as long as possible. The home will be electronically equipped for the delivery of healthcare services and is designed to accommodate a live-in caregiver should that be required.

As with other aging homeowners, our investment in this home will be substantially more than in our previous home in Southern California. The Sea Ranch development and community is witnessing a movement of "age-in-placers," like us, who want to be surrounded by natural beauty yet still be engaged in a productive and sustainable lifestyle. As a result of this transition to owner-occupied, full-time residents (historically The Sea Ranch was a second home development), demand for homes with sustainable lifestyle features will increase along with social services in the community. This transformation will allow "baby boomers" in their prime to remain in their new homes, with support services such as in-home chore work and transportation services provided for hire. This also is driving The Sea Ranch planners to make it a more livable community, based on the Principles of Universal Design that promote community involvement and interaction. The Sea Ranch is one of those special communities that encourages independence and contributions of older people and allows older people to age with dignity and purpose.

Independent Living

We extensively designed our Optimum Performance Home to optimize "independent living" with a focus on a live/work environment that minimizes overburdened tasks and stress. We have designed the home to stimulate us to be as productive as possible for as long as possible. We wanted a home design that would nurture us during our old age, avoiding potential institutionalization. We expect to be mentally and physically nourished by our home and the surrounding beauty of the natural environment for the next 20 to 25 years or for the remainder of our lives. At that time the home will become our legacy and be inherited by our four children and 11 grandchildren.

Staying Productive

Marlene and I own Ultimate Home Design, Inc. and WSR Publishing, Inc., two magazine publishing businesses. As well, we are co-owners of a theme-oriented ocean cruise company, which produces week-long cruises and conferences at sea for special interest groups. I also am a writer and intend to complete several books in our residence at The Sea Ranch. And from time to time I enjoy producing and recording performing artists for concert video productions. While the physical plant and staff for our publishing businesses are located in Southern California, the home is designed with advanced high-definition video conferencing and Ethernet technologies that will allow us to manage our businesses from afar via e-mail and the Internet.

As such, our personal requirements and needs dictated having rooms and spaces to accommodate our productive activities. Our home is designed for sustainable living and to nurture our home office-based enterprises.

We like to think that our home design and approach was a smart decision. We wanted to not only provide for such lifestyle design features to optimize independent living but also incorporate healthier green building materials and energy-saving approaches to achieve "zero-energy cost" home operation, water conservation and minimized environmental impact, as well as comprehensive electronic automation control features that enhance sustainable lifestyles. Our home is designed to be accessible and usable by people of all ages and all abilities, an important attribute with such a large extended family.

We are among the people who have benefited by the electronic age of convenience, independent thinking, and unlimited possibilities. Like others, we demand more from our home than builders are presently delivering. While there are selections of homes at The Sea Ranch that occasionally become available for purchase, none of the homes have met our requirements. Because we will increasingly spend more time at home, we wanted features such as a large home office; a large exhibition kitchen to entertain our extended family, friends, and guests; a dedicated Optimum Performance Home Theatre designed to serve as a reference room matching our reference room in Southern California for *Widescreen Review* (one of the magazines we publish); a combination study/library/surround music room; a workshop to house an extensive Lionel® Train layout (the grandchildren's fascination and mine too); and a solarium to enjoy breakfast and reading in a glass-enclosed, sun-filled environment. We also wanted to be able to entertain on a courtyard with a hot tub, Finnish sauna, and captured rainwater-sourced showers. A dedicated garage will house a flat-bottom fishing boat for excursions on the Redwood-lined rivers that empty into the Pacific Ocean along the California coast, and on the region's lakes. Shared with the fishing boat will be an exercise workout space. There will be two ponds to enjoy; one, a part of the living garden environment for our pet turtle, Henrietta. And a dog run for our two dogs, Ralph and Missy will also be a joy to experience. (Our two cats, Tar and Star, are indoor cats.) An underground wine cellar also was desirable

since The Sea Ranch is within an hour and a half by car of the wine regions of Sonoma, Alexander Valley, and Napa Valley. And we wanted to provide enough room for our extended family so that when the whole family gets together, everyone can be together for as long as possible.

While this home will be bigger and has more amenities than most of The Sea Ranch homes at present, it is not among the largest homes nor will it be out of place with the site and the immediate neighborhood. The design is site-specific and approved by The Sea Ranch Design Committee. The Design Committee worked with our team during the design stages to make refinements that supported The Sea Ranch design philosophy. UHD

The First Optimum Performance Home™

universal design

Synopsis

- Traditional homes are designed for people who never age or experience a disability.
- Universal design needs to become the norm in home architectural and interior design.
- Prepare early to make your homes accessible from the beginning in the design phases by embracing the concept of universal design.
- What universal design features to incorporate?

Introduction

"Universal Design" is otherwise referred to as "Accessible Design," "Inclusive Design," "Design For All," and "Age-Friendly Design." The idea behind universal design is to design and build homes that have no physical barriers, thus sustaining people of all ages and all capabilities in a functional, comfortable, and aesthetic lifestyle. The term, "Universal Design," was defined in 1993 by the late architect Ron Mace as: "An approach that incorporates products, as well as building features and elements, which, to the greatest extent possible, can be used by everyone."

Universal design is not yet the norm in home architectural and interior design. Building codes are written and homes are built with the person of average capability in mind. Countertops, handrails, cabinets, appliances, and plumbing fixtures, and just about everything else, are installed according to specifications that meet an average person's physical stature and abilities. Thus, traditional homes are designed for people who never age or experience a disability.

Nonetheless, for readers of *Ultimate Home Design*, we recommend that you prepare early to make your homes accessible from the beginning in the design phases by embracing the concept of universal design. Doing so is logical and practical, and just common sense, but this realization often comes too late, when homeowners begin to understand the existing environment does not accommodate normal age-related physical changes or disabilities. This is because homeowners tend to have unrealistic expectations about their physical abilities as they grow older, and they underestimate the costs of growing older and do not adequately plan for their future. No one really wants to think of himself or herself as someone who would ever get old and develop a disability, which universal design was originally created to serve. But time stands still for no one.

The Americans With Disabilities Act and the Fair Housing Act have subsequently raised public awareness of how not-so-average people have trouble living and functioning in any home. While many people will first associate universal design with serving the needs of people with disabilities, think about the elderly and the day-to-day challenges they face living and functioning in the typical home. Perhaps you are one of our elderly readers, or a son or a daughter of elderly parents; you can relate to such challenges you or your parents face daily. Think about the so-called "baby boomer" population, which consists of approximately 79 million Americans who, in 10 years, will turn 65 years old. These baby boomers are now caring for their elderly parents and are becoming well aware of some of the everyday problems that are encountered in the home. Anyone in that position can certainly relate to the sensible, practical, and functional approach to home design that can be achieved incorporating universal design features. Also realize that people are living longer than they used to, with life expectancy now at 87 years old for many people. That means there is at least 20 years of healthy and productive living awaiting a majority of our population after they reach retirement age. We need to design homes that incorporate functional live/work environments that nurture sustainable lifestyles and help people "age-in-place."

As noted, universal design is not simply for those who may use a wheelchair, have impaired vision, or have limited use of their arms or hands. Universal design homes are "barrier-free" and provide sustainable living for anyone healthy or ill, from short to tall, young to old, small to big, and everyone in between. Universal design optimizes independent living, thus minimizing the negative impact and emotional stress that non-universal design homes otherwise neglect. Universal design homes can be enjoyed by people who are very different and those homes will be there for all inhabitants, even when their needs change. Universal design is really all about designing a supportive home environment.

The old ways of planning homes just don't work anymore because they are limiting in their design. This is not to say that there is one home design that will be functional and comfortable for everyone, but rather that anyone can design

DESIGN
optimum performance home

a smart home that will meet his or her own personal requirements and needs. These homes should look like other stylistic homes but be much easier to live in than the homes to which most of us are accustomed. We refer to such homes in *Ultimate Home Design* as Optimum Performance Homes™. These are homes that not only provide for universal design features but also incorporate sustainable green build materials, energy-efficiency build quality, ENERGY STAR® appliances, on-site power sourcing, water conservation features, and comprehensive electronic lifestyle features that add comfort, stimulate creative or productive work at home, provide for in-home health monitoring and the delivery of services, and help to achieve a "zero-energy cost" home operation.

We advocate an all-inclusive approach to home design that is holistic and optimizes human-centered sustainable living. The idea is to adopt home design features that make a home environmentally optimized, safe, and comfortable for everyone, young or old, whether they have a disability or not. And, as well, to use innovative design techniques that offer visual appeal and increase appreciation value and the "curb appeal" for the home.

The Home's Universal Design Features

In the Optimum Performance Home at The Sea Ranch, the following universal design features will be incorporated:

- Zero-step entries will be provided so that no one needs to use steps or stairs to enter the home, move through the home's main rooms, navigate around the home, or enjoy the courtyard, deck, or a walk outside to the garden, ponds, and stream. Anyone will be able to get out of a car and into the home without running into any barriers. The design supports full "visitability," with no restriction to social interaction due to physical environmental barriers, thus allowing people of all abilities to freely interact and socialize in the home.
- The three-building compound is designed to be barrier-free with one-story living for the homeowners; only the guest bedrooms are on a second floor, and this provides for universal design features and a future elevator, if required. If needed, this second floor could provide flexible living space for a live-in caregiver.
- The set of stairs leading to the guest bedrooms, bathroom, and study/library/surround music room will feature treads 11-inches deep so that your entire foot can rest on the stair. The treads will be 36 inches wide, just wide enough to install an electric/battery-powered stairway chairlift in the future if someone needs it. Stair risers will have a height of seven inches.
- Handrails will be provided on both sides of the interior staircases—one to the second level and one in the garage—and exterior staircases down to the underground wine cellar.

Circle #10 In Advertisers' Index For Information

• Doorways will be at least 36 inches wide to make it easier to move big things in and out of the home and to let wheelchairs pass through.

• Insulated, solar-gain-reduced glass-enclosed hallways will be eight-feet wide, and the main walkways will be five-feet wide throughout the home, allowing easy movement from room to room.

• While floor space will be quite efficient, it will be very functional and, combined with the cathedral ceilings, create a comfortable feeling of space.

• All floorings will be non-slip surfaces to help people stay on their feet.

• One gradual sloping ramp will be provided from the interior of the garage to the glass-enclosed walkway with handrails on both sides of the ramp. While wheelchair users need ramps to get in and out of buildings, ramps can also assist other people regardless of age or strength.

• Bathroom and shower spaces will be constructed with non-slip surfaces and feature architecturally and aesthetically designed 250-pound-support textured grab bars around toilets, tubs, and showers. Telephones will be placed within reach of the toilets, tubs, and showers.

• All toilet seats will be elevated 17 inches off the floor for easier seat entry/exit.

• The master bedroom suite's bathroom will feature a roomy walk-in/roll-in/curbless shower and sunken Japanese soak tub with a flat ledge where one can sit and slide over into the tub. Full-spray hand-held showering units will provide optimum flexibility and accessibility.

• Bathroom vanities will be adjustable between 34 and 36 inches off the floor with knee space beneath. A single-lever handle will control hot and cold water.

• All thresholds will be flush with the floor to make it easy for people to get through a doorway or passageway. They will also keep people from tripping and facilitate easy wheelchair maneuvering.

• The lighting design provides focused light where it is needed to help people see better as well as help people with poor vision. Floor lamps and nightlights will be positioned to direct light where it is needed. The stairway to the second floor will function as a lighted art gallery. All outdoor walkways will be well lit using down-facing lights. All lighting can be electronically programmed to turn on automatically and according to a particular ambiance. Light switches will feature large rocker controls, which are easier to turn on and off. There will even be applications in the home that use photo luminescent materials that provide a low-level glow that can be used to mark paths and home automation controls.

• The home is designed with extensive use of robust sliding pocket doors, which disappear inside the walls. They provide more room, especially in small rooms.

• All door handles will be levers or "D" designs, and light switches and whole-house controls are designed for people with poor hand strength and poor vision. In fact, the handle and control designs are better designed than knobs or standard switches and make it easier for everyone to operate.

• Closets will feature future-proof adjustable shelves to accommodate the reach capabilities of different occupants and are thus, adaptable to changing needs.

• The bottom shelves of wall-mounted kitchen cabinets will be 48 inches from the floor to allow better reach access. That's 12 to 15 inches above the rounded corner countertops. Cabinets and cupboards will be equipped with sliding drawers to reduce the amount of or need for reaching and bending. A very large floor-to-ceiling custom lazy Susan revolving pantry will provide easy access to pantry-stored food and portable kitchen appliances. The revolving shelves will be deep and adjustable.

• Cooktops and ovens will be positioned for functionality. The controls will sit at the front of the two cooktops, and ovens will have push-button controls.

• The two ovens and the microwave oven will be mounted side-by-side with controls at no higher than 48 inches above the floor.

• Kitchen countertops with pullout cutting boards are designed so that everyone in the family, no matter what limitations they may have, has a workspace that optimally fits them. So when everyone wants to help with dinner, grandchildren, children and guests feel comfortable assisting. Thus, most countertops will be 36 inches from the floor with a couple at 32 inches from the floor. The lower countertops will have enough knee space under the counter to pull up a chair or wheelchair.

• The button-controlled dishwasher will be raised eight inches off the floor to make loading and unloading the dishwasher easier.

• The shelves of the large side-by-side refrigerator will slide in and out, and the refrigerator will feature door-accessible water and an ice dispenser.

• The kitchen sink will be about six inches deep and adjustable between 34 and 36 inches high off the floor, with knee space under the sink. A single faucet mounted to the side will control hot and cold water with one lever handle, not knobs.

• All electrical outlets and computer terminals will be positioned on walls for better access and to make it easier for people with limited reach capability. They will be positioned between 15 and 27 inches off the floor, with some 30 to 44 inches from the floor.

• Laundry appliances will feature universal design raised comfort heights and will be front-loading for easier operation. The controls will be at the front so the washer and dryer can be used while seated. Such new machines, now available, are energy efficient and use less water.

• Kitchen appliances will be designed to optimize reach and function capability.

• All appliances will be ENERGY STAR-rated to be energy-efficient.

• The home will be extensively electronically smart to conserve energy. One of the safety features will be that smoke detectors, whether battery or electrically-powered, when triggered, selectively turn on lights to show escape routes.

This approach to design can make any home future-proof and adaptable to a family's changing needs while providing added value. It epitomizes the idea of building a home for life.

For more information on universal design, please visit the Center for Universal Design Web site at www.design.ncsu.edu/cud. UHD

The First Optimum Performance Home™

electronic lifestyles

Synopsis

- Whole-house electronics and home automation control are aspects of the "digital home" and the essence of a lifestyle based on convenience, entertainment, and safety.
- Designing for smart automation controls and electronics throughout the entire home.

The Digital Home

Whole-house electronics and home automation control are aspects of the "digital home" and the essence of a lifestyle based on convenience, entertainment, and safety. Structured wiring provides the means to have smart automation control and electronics throughout the entire home.

In the Optimum Performance Home at The Sea Ranch, home entertainment products will be extensively deployed and strategically placed throughout the home for optimum performance. Not only will there be a dedicated Optimum Performance Home Theatre, but studio-quality home theatre components will be integrated into the design of the living room, home office, master bedroom suite, guest bedrooms, and the study/library/surround music room. As the publisher of *Widescreen Review*, a premiere home theatre magazine, and a recording engineer/music video producer, experiencing movies and HDTV programming in a performance widescreen home theatre is an important requirement in my lifestyle. Not only will the home feature home theatre spaces, but it will also be wired extensively for distributed high-resolution multichannel audio and high-definition video. There will be high-end projectors, rear-screen projection monitors, direct-view professional CRT displays, and thin flat-panel video displays in different spaces in the home. Both the widescreen rear-screen projection system and the three-sided fireplace are designed to be in direct view from the living room, dining room, and kitchen. Also, a whole-house Ethernet network will be provided so that computing and outreach to the Internet is facilitated in every room of the home. This network will also feature wireless capability throughout the home, in the courtyard, and on the grounds.

The home theatre/surround music systems will be high-end standalone, in-wall, and on-the-wall installations. The in-wall and on-the-wall systems are intended for casual listening and viewing, while the dedicated systems are for a serious audiophile and videophile experience. The home theatre systems will also feature high-end video gaming capability. HDTV reception will be provided by satellite, which will be fed to every room of the home with a widescreen television monitor. A networked system will be integrated with Microsoft's Windows Media Center and will be future-expandable over CAT6 using an Ethernet network. Core product areas will include multi-room/multi-source controllers, distribution amplifiers, in-ceiling/in-wall/on-wall loudspeakers, infrared distribution systems, and user interfaces.

The home office will be equipped with a high-definition videoconferencing system so that Marlene and I can enjoy visual contact with our staffs and our family and friends. This system will be integrated into the distributed video system in the home.

An infrastructure of advanced broadband hard-wired and wireless Wi-Fi and Local Area Network (LAN) systems will facilitate a live/work scenario with integrated home networking from room-to-room and out-to-the-world-at-large through the Internet. A separate whole-house structured wiring system will be incorporated for distribution and control of audio, video, phones, videoconferencing, intercoms, and computers.

Efficient illumination design and lighting systems will be used. Extensive lighting automation controls will be distributed throughout the home to create ambient effects and to conserve electricity. For example, occupancy sensors, which are motion activated, will operate in the vestibule and glass-covered walkways, laundry room, garages, and other spaces. Natural light-filtered fluorescent lamps, which burn cooler and last longer than incandescent bulbs and draw a quarter of the electricity, will provide a significant amount of lighting in the home. The lighting will be well-controlled so that the interior lighting does not illuminate the outside of the home, and all exterior lighting illuminates downward toward ground surfaces rather than up, allowing for a star-speckled sky.

There will be various home control technologies used in the home in addition to the Ethernet network, including Internet protocol (IP) and radio frequency spectrum (RF) networks. Various networked products, including lighting, HVAC, appliances, and security will be controlled using these technologies, and they will communicate directly. These networks will encompass control of temperature, points of entry, garage doors, window coverings, smoke detectors, and other household devices, even home entertainment. One of the interoperability features of the home's control networks will be to selectively turn on the lights when a security alarm or smoke detector is triggered.

All wiring will be concealed in the architecture through conduit and the use of wiring channels within wallboards and beneath floors. There will even be a whole-house security system that uses remote-monitored tiny infrared video cameras, which will be inconspicuously placed. Other smart home features will include any-room control of all of the lights and lighting schemes, and electronic-controlled window shades and blinds.

A number of safety measures also will be implemented around the home, such as monitoring and communications that are user-friendly. The role of these electronic devices is to enhance the safety of people who live alone at home by monitoring their health and behavior. These include "smart phones," now in development, which contain miniaturized computers for programming opening and locking doors, turning on or off appliances, giving audible instructions or reminders regarding medication, as well as alerting people when assistance is required. This is accomplished using a computer network and sensors that monitor changes in occupants' lifestyles, which can serve as caregivers to alleviate anxiety of family members who live far away. The same computer network, called a "digital family portrait," can visually display the occupants' activities. The home device tracks activities by small, radio frequency tags worn by the occupants. Antennas hidden in various places in the home pick up the signals and transmit them to the computer, accessible on the Internet.

Electronically, this will be an extraordinarily equipped and featured home with lots of user-friendly technology. UHD

The First Optimum Performance Home™

green building

Synopsis

- "Green" building is the process of incorporating environmental considerations into every phase of home building construction, including site-specific positioning, environmental impact, use of sustainable and renewable materials, energy-efficient building techniques, water conservation, indoor environmental air quality, and self-generation of energy to effectively achieve "zero-energy net cost" operation.
- "Green" building is all about designing homes that perform better yet use fewer resources to build and operate.

Why Build "Green?"

Stories abound in the media about environmental degradation, shrinking natural resources, and evidence of global warming. While so many stories on the environment are disheartening, there is much to be encouraged about, if not inspired, as an ever-increasing number of people are tackling these issues as they relate to their own housing and living environments. In its simplest definition, "green" building is the process of incorporating environmental considerations into every phase of home building construction, including site-specific positioning, environmental impact, use of sustainable and renewable materials, energy-efficient building techniques, water conservation, indoor environmental air quality, and self-generation of energy to effectively achieve "zero-energy net cost" operation. Green building is all about designing homes that perform better yet use fewer resources to build and operate. Compared to a traditional home, a green-designed home is more durable, more comfortable, less expensive to operate and maintain, and a healthier place to live.

Known as "green building" or "sustainable building," the awareness and the movement to spread this awareness began in the 1960s. Then, as is largely the case now, custom builders have been at the forefront, building homes that use greener building practices and products. Measures have ranged from the obvious desire to site and orientate a home to harvest light and warmth from the sun, to more technical and sophisticated systems, such as geothermal heating, and power from the sun and wind.

As a magazine that encourages green building practices, it is becoming increasingly evident that some form of application of these principles can be readily incorporated into any mainstream building practice, resulting in a more energy-efficient home due to reduced energy consumption and lower operational costs. We advocate creating low-energy, low-impact, non-toxic homes that are, above all, comfortable and aesthetically pleasing.

While most people buy homes to live in for five years, there is demonstrable benefit across the board, in terms of marketability, cost-savings, reduced energy consumption, and healthier, non-toxic environments, to build green and keep your home longer. This also adds value to a home's appreciation.

No doubt, architects, designers, developers, and builders are increasingly becoming more astute in the vocabulary of green building, which is stimulating new green

build home designs that incorporate sustainable and renewable materials, efficient energy use, and clean (non-fossil fuel derived) energy production. But what will really drive this movement and redirect most American's short-term attitude toward their homes, is homeowner education—the prime mission of *Ultimate Home Design*.

Getting there will not be easy. Our society has a propensity for not carefully digesting information that is more involved than a few simple sentences. We intend to provide synopses of articles that are written in-depth with the idea that they will inspire our readers to delve deeper into the subjects covered in *Ultimate Home Design*.

Our advertisers also do a good job of stimulating our readers to inquire further as to their options as homeowners who want to better their living conditions and standards.

As a deeper green environmental movement becomes stronger, subdivision builders are beginning to include more environmentally friendly features that their informed homebuyers are asking for. As a magazine, our mission is to better educate homebuyers on quality, comfort, energy, accessibility, and health in housing. There are no national or regional guidelines that describe what comprise environmentally optimum performance home systems. This lack of standards puts homebuyers in the position of not knowing what to look for and reduces builder trust of new approaches. Green homes can look like any typical home and thus are hard to spot from the road.

True green builders can be even harder to find. Plus, there aren't presently many green homes out there, especially homes designed to integrate all of the concepts advocated in *Ultimate Home Design*, although a sort of "critical mass" is certainly being reached. The numbers are growing, as the building industry is now prone to develop and sell green products that are more viable. Furthermore, certification programs such as the new LEED for Homes rating program will offer home buyers guidance in creating demand for homes that feature systems-oriented and holistic architecture.

We all need a roadmap, and it is our sincere hope that *Ultimate Home Design* can help provide one. Look to future issues of the magazine for an indepth dissection of the design approach and the building elements that are employed in bringing to life the Optimum Performance Home at The Sea Ranch, an exemplary green build home designed for lifespan living. UHD

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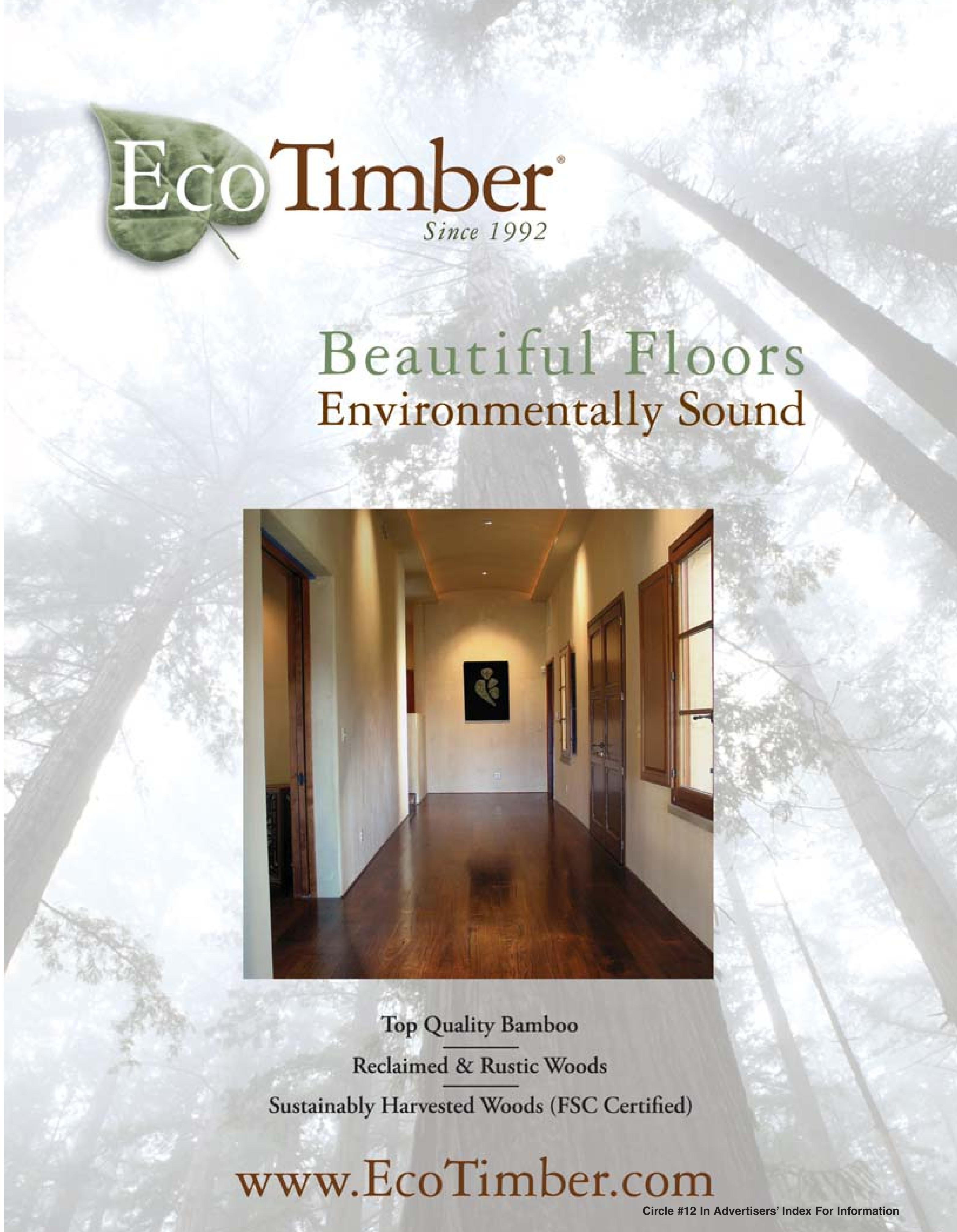

UNIVERSAL DESIGN:
paradigm for the 21st century

Wolfgang F.E. Preiser, PhD

Synopsis

- **This article is intended to serve as a general introduction to the still young and evolving movement of universal design.**
- **Universal design is the inclusive, non-discriminatory design of products, buildings, environments, and urban infrastructure, as well as information technologies that are accessible to and usable by (almost) all. This is regardless of health, disability, gender, ethnicity, or cultural background. Ultimately, universal design is about the power of lifting the human spirit beyond the minimum requirements the Americans with Disabilities Act (ADA) has legislated. In order to ascertain the viability of the "Seven Principles Of Universal Design," it will be necessary to develop objective and explicit performance criteria, which can be aligned with the traditional priorities of criteria, including: health/safety/security, function/efficiency/work process, and social/psychological/cultural performance. These can be related directly to building codes, the life safety code, and design guidance in such handbooks as "Time-Saver Standards." Beyond that, useful guidance for the designer has been drawn from environment/behavior research over the past 35 years. Due to the limitedness of systematic, universal design evaluation research, I propose to evaluate case studies, especially in the field of housing and home design. The underlying framework is transactional, meaning that the universally designed environment facilitates its use by a vast majority of people. As a conclusion, recommendations for the future are made.**

Figure 1
Ramps In The Former TWA Terminal

Introduction

Universal design is about the power of buildings to lift the human spirit, especially when they are designed to truly meet the needs of people who use them. Universal design ranges from inclusive and non-discriminatory design of products, to cars, architecture, and urban infrastructure, and perhaps most importantly, information technology.

"Universal design ranges from inclusive and non-discriminatory design of products, to cars, architecture, and urban infrastructure, and perhaps most importantly, information technology"

The image that is the complete opposite of universal design is the former TWA (Trans World Airlines) Terminal at JFK (John Fitzpatrick Kennedy) Airport in New York City, which was designed by the renowned architect Eero Saarinen (Figure 1). Since the ADA became law in 1991, one can be criminally prosecuted for not providing building access to educational programs and job sites. The elegant stairs Saarinen had designed were covered with ramps, as everybody using that airport had to be accommodated. People with wheeled transports, such as wheelchairs and suitcases, can be seen. After-the-fact fixes like these ramps compromise the idea of universal design because one should incorporate an inclusive way of thinking and designing concepts into projects from the very beginning. Part of the mission of *Ultimate Home Design* magazine is to educate homeowners, architects, designers, builders, contractors, and developers to incorporate universal design features in the design and building of homes.

The official definition of universal design is: "The design of products and environments to be usable by all people, to the greatest extent possible, without adaptation or specialized design," and this regardless of people's height, health, cultural

Figure 2
Inaccessible Main Entrance To St Gile's Cathedral In Edinburgh, Scotland

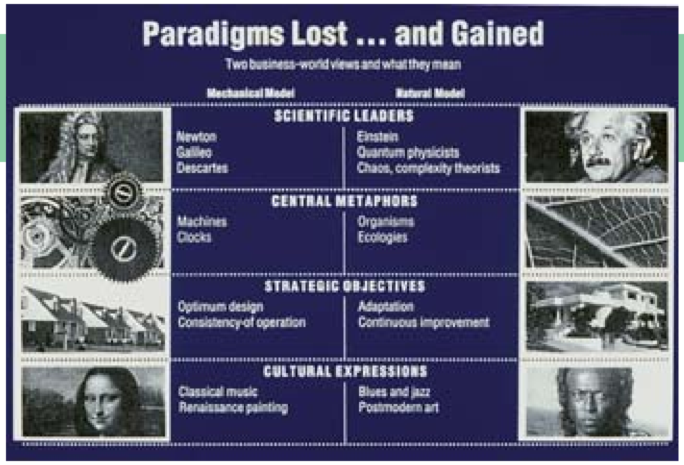

Figure 3

Figure 3, 4 & 5
New Paradigm—From Fixed To Living Systems

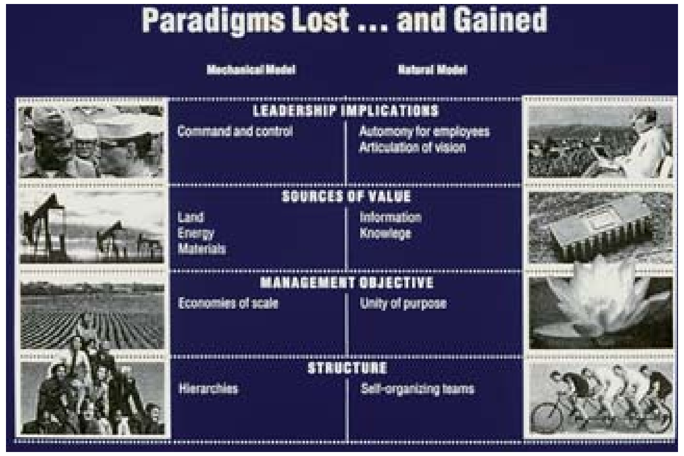

Figure 4

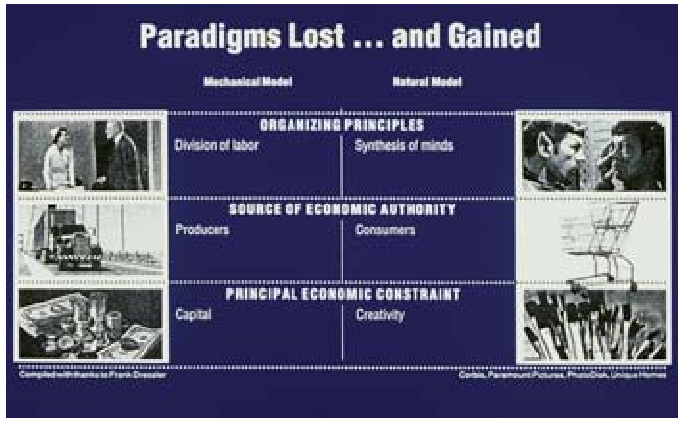

Figure 5

background, disability, and other factors. Universal design may be needed by anybody any day. Those who experience the aftermath of an accident quickly realize how inaccessible much of the built environment really is. Another curious example can be found in Edinburgh, Scotland at the cathedral dedicated to the patron saint of the disabled, St. Giles (Figure 2). Unfortunately, the cathedral, now converted into a tourist information center, belies its name; its main entrance is not accessible to people with disabilities!

Paradigm Shift

In the world of business, a significant paradigm shift has taken place in recent decades. For hundreds of years, the Newtonian paradigm, with its mechanical, hierarchical, and natural resource/capital-driven system prevailed. Supply side domination of the marketplace used to dictate and limit consumer choices: you can buy your Model-T Ford in any color, as long as it is black. Similarly, in the post-World War II era, monotonous housing in suburbs like Levittown, New York assumed that one size fits all (Figures 3, 4, and 5).

Einstein's Theory of Relativity not only led to the development of cybernetics—the science of feedback—it ultimately evolved into the new paradigm for business. It advocates self-regulating systems, as well as feedback-based, continuous quality improvement. This amazing movement started with cruise missiles, which can read the terrain and use the feedback to adjust their course toward a target. It now allows for consumer-driven, customized mass production of products, cars, homes, and other commodities. Information, not extracted minerals, industrial or agricultural products, or consumer goods, is the currency of the day. In Silicon Valley and the film industry, and for high-tech enterprises like Microsoft, creativity is the driving force. Clearly, this also applies to the major design disciplines: industrial, graphic, fashion, digital, and interior design, as well as architecture.

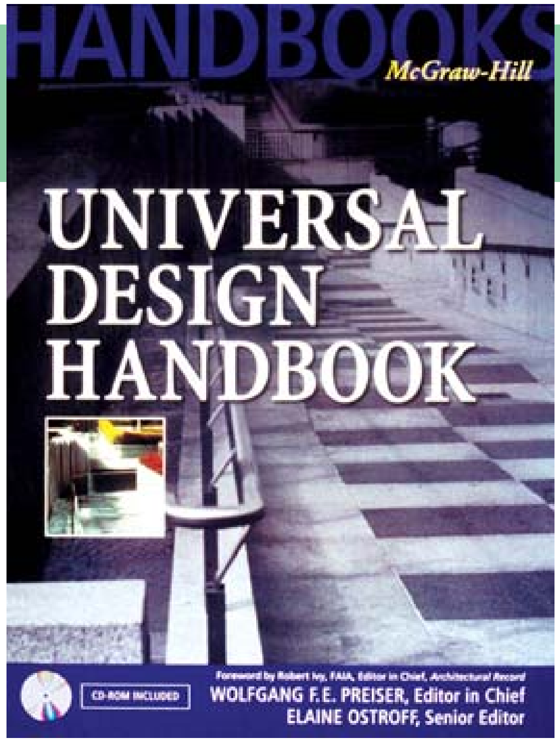

Figure 6
Universal Design Handbook

Universal Design Handbook

Many questions about universal design can be answered by my book, which was co-edited with Elaine Ostroff, *Universal Design Handbook* (Figure 6). It contains chapters on conceptual frameworks, and policies for universal design at the building, community, and global scales, as well as case studies from around the world.

The back cover of the *Universal Design Handbook* contains a CD with the ADA Guidelines (ADAG) and other helpful materials. These guidelines can be downloaded and used to determine what provisions are relevant to specific design projects. However, one needs to reemphasize that universal design is intended to go beyond the ADA's minimum requirements.

What Is Universal Design?

Everybody has seen the OXO product line—aka "Mr. Good Grips"—kitchen utensils (Figure 7), with their rubbery handles, which are easier to grip than normal handles. On the downside, they may also be more difficult to clean, if the rubber ribs get clogged up.

Perhaps the most common and universally designed gadget is the mobile phone (Figure 8). Clearly, mobile phones are very convenient. They can be used to communicate in emergencies or when meeting up for a lunch date. With technological advances, they can be used to access email, send text messages, or check the stock market. Perhaps most important of all, mobile phones have the promise of bridging the real digital divide between rich and poor countries. A recent quote from The Economist reads, "Mobile phones are, in short, a classic example of technology that helps people help themselves."

However, due to distractions, mobile phones are said to have increased the risk of car accidents four-fold, regardless of whether the device is hand-held or hands-free. Consequently, a number of states and providences have outlawed mobile phone use while

Figure 7
OXO Potato Peeler

Figure 8
Mobile Phone

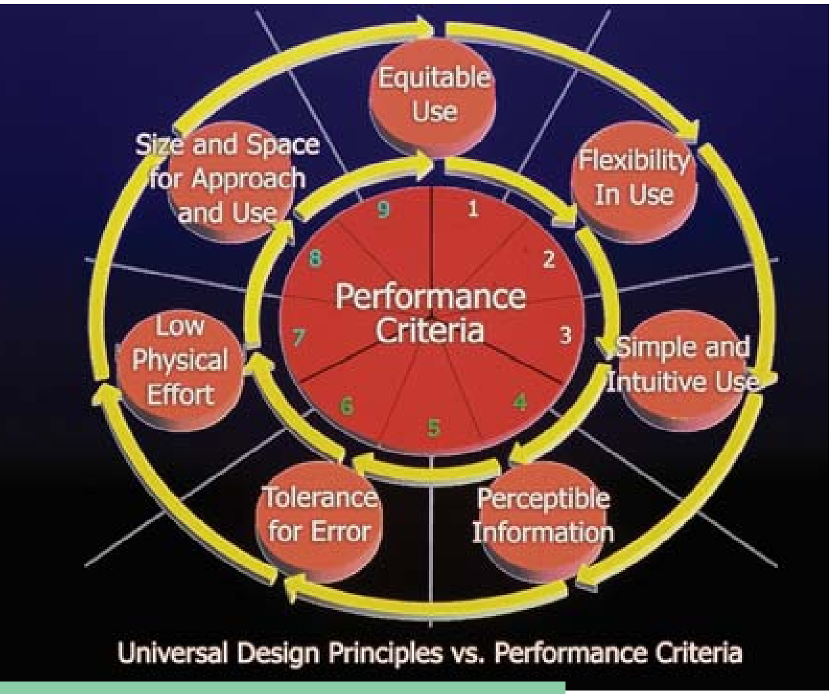

Figure 9
Seven Principles Of Universal Design™

driving a vehicle. A more sinister use of mobile phones is to remotely detonate roadside bombs, as is seen in Iraq on a daily basis.

Illustrating The "Seven Principles Of Universal Design"

The "Seven Principles Of Universal Design" were developed by the Center for Universal Design at North Carolina State University. The late Ron Mace founded the Center.

The Seven Principles Of Universal Design are rather lofty ideals and guiding principles that need to become more practical and operational, so that designers, architects, and everyone else can use them in their projects.

Principle 1: Equitable Use

"The design is useful and marketable to people with diverse abilities."

"Equal Access" speaks to our democratic principle of equality, meaning that everybody should have equal access to and equal use of products and environments. "Provide the same means of use for all users, identical whenever possible, equivalent when not" deals with stairs and building entrances, but also means of communication (see below). For example, if one is dealing with a historic structure and a classical Greek portico, one doesn't want to put a ramp across the stairs like in the TWA Terminal building already referred to. One will have to figure out equal access by perhaps using a side entrance where there is an elevator that can reach all levels of the building.

Overcoming the real digital divide is one of the great benefits of cell phones. Think of the enormous cost of infrastructure investments if one had to build land-lines—instead, they are using cell phones, which are a realistic way for poor people to make progress, to connect with the world, and to generate income.

Ultimate Home Design Feature: When planning and designing an "Optimum Performance Home," the entrance solution without threshold pictured in Figure 20 can be employed, thus providing equal access for all.

Principle 2: Flexibility In Use

"The design accommodates a wide range of individual preferences and abilities."

Choices And Adaptability: "A product provides choices in the method of use, and accommodates

Figure 10
Shipping Container Adapted To Housing

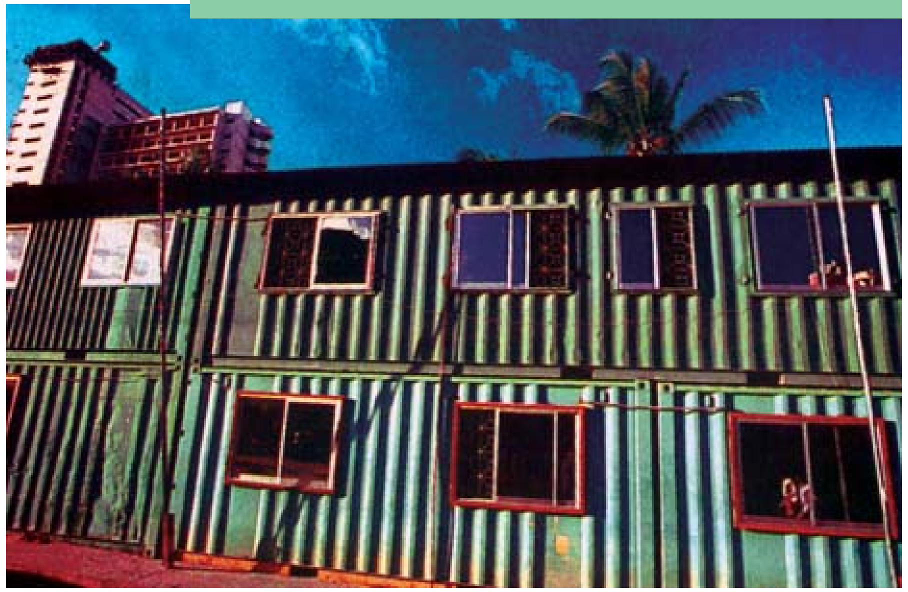

Figure 11
Elevator Floor Mat Showing Weekday

right- or left-handed use," like Fiskars® scissors or classroom seating with writing tablets. The spirit of universal design is exemplified by arrangements providing for flexibility and choices in designing for human-centered activity.

Another unusual example of universal design is shipping containers in South Africa (Figure 10). There is little to ship back from South Africa, and it is too expensive to take them back empty, so the containers were adapted to provide housing for South Africa's less fortunate—a universal design application of a very basic commodity.

Ultimate Home Design Feature: In the "Optimum Performance Home," provision should be made for space to accommodate an elevator, should that become a necessity at a later time. For example, the latest generation of transparent and tube-shaped home elevators works on the principle of suction, and has brought the price to affordable levels. Some home elevators can even accommodate a wheelchair.

Principle 3: Simple And Intuitive Use

"Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level."

Signage: Signage is very important in universal design and needs to be made simple so it communicates effectively. For instance, there should not be unnecessary complexity in information communicated in elevators. A hotel elevator in Vancouver, B.C., had floor mats showing the day of the week, such as Sunday (Figure 11), Monday, Tuesday, etc. Why? When flying across the Pacific from West to East, you can arrive before you left in terms of calendar date and time, and that can be very disorienting.

Ultimate Home Design Feature: Today, literally all appliances and gadgets have computers and displays incorporated, the use of which is often very frustrating, especially for the older generation. Simplifying these can open up new markets, as the recent introduction of simple phones in the U.K. demonstrates, thus eliminating countless options and features, which the average user does not want or need.

Principle 4: Perceptible Information

"The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities."

Figure 12
Directional Signage Using Integrated Graphic

Figure 13
Wide Corridor In Alzheimer's Center

Redundancy Of Sensory Modes: There needs to be some degree of redundancy among the different senses, especially when one is dealing with emergency exits and the signage and signals use sound, light, or even strobe lights. One can use different media, like pictograms, touch, or other means of presenting stimuli or information. The legibility of essential information should be enhanced, using varieties of letter sizes, fonts, colors, and graphics.

Integrated Signage And Décor: Eva Maddox, a graduate of the University Of Cincinnati's Interior Design program, and who practices in Chicago, has done wonderful things at Children's Hospital in Cincinnati. Based on an ecological theme, she created an interactive mural in the entrance hall where kids can play while waiting. That is just an introduction to her design concept. Throughout the building, one can find the same theme carried into an integrated signage system, helping the visitor to know where he/she is. For example, a bird may be the symbol for the fifth floor; it is shown in the directory (Figure 12) and, in a very subtle way, seen in the carpeting of the fifth floor.

Bathrooms and Toilets: Many organizations have adopted so-called "unisex" bathrooms. But are those universal design or not? At Kaiser Permanente in California, this means that men and women, with or without disabilities, share the same bathroom. Is this a fair approach, considering that these groups take different amounts of time in bathroom use? The Obayashi Corporation tower in Tokyo, Japan exemplifies another, quite different and sensible approach. Designed by Lord Norman Foster, a Pritzker Prize recipient, which is the equivalent of the Nobel Prize for Architects, it is surprising to see how subtle and universally his labeling for bathroom was conceived. There are none of the traditional signs pointing to bathrooms. Instead, a green dot signifies "bathroom." One enters through a door and ends up in front of a unisex bathroom. How does one know whether it is occupied? A small red light goes on when someone locks the door from the inside. The Japanese appear to be light years ahead of us in design, as seen in toilets manufactured by Toto. They have produced programmable toilets for quite some time now, and they have functions/features most Americans have never thought of: standby, varying water pressure, and bidet features, plus a red call button to be used in case of an "emergency."

Figure 14
Accessible London Taxi With Fold-out Ramp

Ultimate Home Design Feature: For the visually impaired, tactile signs in floor surfaces and handrails can provide clues and guidance, including gates that need to be engaged before entering staircases. Other sensory display modes, e.g., for the hearing impaired, might employ strobe lights for smoke detectors, which can be helpful, especially in an emergency.

Principle 5: Tolerance For Error

"The design minimizes hazards and the adverse consequences of accidental or unintended actions."

Environments For Patients With Dementia: For Alzheimer patient care facilities, it is critical to minimize hazards, to provide warnings of hazards, and provide failsafe features. In the case of the Alois Alzheimer's Center in Cincinnati, they use the medical model of a differentiated approach to patient care, depending on the stage of the disease. The physical environment is very sophisticated and designed accordingly. In the first phase, it looks like any other retirement center but gets more restrictive as the patient's disease progresses. The Center is a good example of adaptive reuse. It is a former elementary school in an area where there are no more elementary students. They renovated the building with wide corridors, extra-wide doors, roll-in showers, and very large windows with views into the surrounding neighborhood and landscape. All of these features are beneficial for Alzheimer's patients (Figure 13).

For patient protection, an inner courtyard with meandering path and lush landscaping, with electronically-controlled doors, allow patients park-like walks.

Ultimate Home Design Feature: So-called Patio Homes are the rage of the day, making single-level living a convenient option for empty nesters and beyond. Slip-and-fall accidents must be avoided at any cost, particularly among the elderly. Sunken living rooms and small level changes should be discouraged, and steps and risers should be marked through good lighting, as well as color and tactile clues.

Principle 6: Low Physical Effort

"The design can be used efficiently and comfortably, and with a minimum of fatigue." This principle has to do with inclines and surface characteristics like carpeting versus hard floors. Also, one needs to find ways to reduce the expenditure of effort and to minimize repetitive actions, at all scales of the environment.

Mass transportation: London is considered the most accessible city in the world. All new taxis have to have foldout ramps (Figure 14), which take a few seconds to put in place. All older model taxis are required to have one of these ramps in the trunk. In addition, these taxis are very comfortable--with high ceilings and multiple seat configurations, ideal for wheelchairs. On the other hand, the subways (called "tube") are not accessible at all, except the recently built Jubilee Line. Meanwhile, in Paris, where they have thousands of taxis, only two are actually accessible via ramp.

Figure 15
Mass Transit Bus System In Quito, Ecuador

Continuing with mass transportation, in Ecuador and Brazil, a rapid transit system has been developed that uses dedicated high-speed lanes. Bus stations have ramps on either side (Figure 15). After entering and paying, one is level with the floor of the buses— meaning that they can be emptied and filled up rapidly. There is no delay for paying or being in a wheelchair. This is a universally designed rapid transport system.

Ultimate Home Design Feature: Lever-type hardware for doors and sinks is a good example, especially for people suffering from arthritis and diabetes, which can leave limited sensory and grasping capability in fingertips. Reducing unnecessary expenditure of effort through hard-floor materials that is mentioned in the case study at the end of this article, is beneficial. Door pull should be limited to 8 pounds maximum, and while automatic door openers are uncommon in home design, they may be justified under certain circumstances.

Figure 16
Accessible Grocery Store Counters

Principle 7: Size And Shape For Approach And Use

This principle refers to dimensions, adequate reach, enough height, clear lines of sight, appropriate door pull, etc. At the University of Cincinnati, evaluations of supermarkets, banks, hospitals, and other building types have been carried out. It was found that many of these facilities, despite meeting the ADA guidelines and regulations, are not accessible. For example, at the meat counter, if the customer shown (Figure 16) wants to reach the attendant's call button, she can barely reach it, or maybe not at all. So she has to shout, or has to make herself noticed by the people behind the counter. Why not have one segment of the counter low, so that people in wheelchairs or children can have eye contact with the people behind the counter?

The largest grocery chain in the U.S., Kroger, has bank branches in their stores, which are exemplary. They have one lowered counter section where one can actually sit in a wheelchair and do transactions with the clerk.

If integrative thinking is used from the start, the built environment can be made a level playing field, literally.

Ultimate Home Design Feature: Adjustable height of bathroom and kitchen cabinetry can be found in exemplary European designs and products, but at a price. Sliding drawers in kitchens are no longer “special,” but have gone mainstream. Kitchen countertop work surfaces at varied heights, curb-less showers, and accessible height closet rods are already common features.

An Example Of Progress Being Made

A recent article in *The Wall Street Journal* discussed elevator safety for all building users, including rescue personnel. This article, “Panel May Recommend Firefighter Elevators,” reflects on the commission that is investigating 9/11 and the fall of the World Trade Center towers. Why is it that other countries' building codes in Europe and most of Asia require these lifts—although the rules differ? In the U.S., we not only forbid people to go down in elevators, but the firefighters cannot use elevators to go up and help people to evacuate. In 1993, they had to walk up the World Trade Center stairs, which is utterly ineffective. In those countries, like Malaysia with the Petronas Tower in Kuala Lumpur, designed by Cesar Pelli, such elevators are common. The new Freedom Tower in New York City, designed by SOM, will have such an elevator. To quote: “Disability rights activists are strong supporters of the elevators. What we learned from 9/11 and many events before 9/11 is that the ability to evacuate multi-story buildings is an issue for a broad spectrum of people who would never identify themselves as disabled, but who couldn't negotiate so many steps,” says June Kailes, a Los Angeles-based disability policy consultant. This is true, because there are many people who are not necessarily using wheelchairs, but have all kinds of mobility problems, and who would find themselves stranded on the 100th floor, and they probably all perished. So we have a lot to improve on in the area of emergency exiting from tall buildings.

Epilogue

In an example of a universally designed residence in Cincinnati, the author was asked by the clients (both of whom had suffered serious disabilities) to intervene just in time before the builder would have erected a standard design for an essentially inaccessible home. The way the house had been designed originally, the owners could not enter their home through the front entrance, nor could they access the patio in the back of the house. They could only enter through a ramp in the garage, which would have been rather undignified. Design changes were made, all of which contributed to a very simple solution. (Figure 17) A minimal, quarter-inch high threshold with a means to drain water away in case there is a rainstorm and a special rubber seal under the entry door to keep water out was employed.

Furthermore, the house plan is basically open. There are almost no doors. The exception is the master bedroom, which has double French doors that are normally kept open. There are hard floors, both hardwood and carpeting. Different heights of counters can be found in the kitchen, with slide-out drawers in the kitchen cabinets, a lowered kitchen island, 18-inch-high electrical outlets, and adjustable heights for sinks. My very recommendation is that with the aging of America, developers and builders should embrace universal design as a concept not only for retirement communities, but also home design in general. The “Life-wise Home” demonstration model by the NAHB Research Center (National Association of Home Builders) just outside Washington, D.C. and the “Lifetime Homes” developed by the Joseph Rowntree Foundation in the U.K. are good examples to follow in the future. UHD

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Figure 17
Entrance Without Threshold

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LEED® FOR HOMES

an introduction to the U.S. Green Building Council's newest rating system

"The goal of a green home is to step more lightly on Mother Earth."

Ann Edminster, M.Arch &
Jay Hall, PhD

Follow The LEED® For Homes

LEED® (Leadership in Energy and Environmental Design) for Homes is a new green building rating system from the U.S. Green Building Council (USGBC) that's being designed to help home buyers identify newly-constructed homes that are both environmentally friendly and more affordable to own. A certified LEED Home—which, like all buildings certified under LEED rating systems, is third-party verified—will offer the following valuable benefits:

- Healthier indoor air
- At least 30 percent greater energy efficiency
- At least 30 percent greater water efficiency
- Improved durability and more environmentally friendly building materials
- At least 30 percent less storm-water runoff
- Climate-appropriate landscaping
- Higher market value

Currently in its "pilot" phase, the LEED for Homes Rating System is being created through the USGBC's consensus processes by a national team of green home-building experts. The pilot program began this past summer, operating in markets across the United States. As of mid-November 2005, 40+ builders in eleven test markets had committed to building and rating homes using the pilot version of LEED for Homes. The rating system is expected to be released for public comment, approved, and nationally launched in early 2007.

What Is A Green Home? A LEED Home?

LEED for Homes is being developed to distinguish high-performance homes, which are designed and built to perform substantially better than conventional homes. There are currently more than 50 local green home-building programs across the U.S., each with a somewhat different approach. LEED for Homes will be the first national leadership standard for green home-building.

"Green homes" have often been perceived and portrayed as funky, hippie, crunchy granola-type structures, an image acquired during the era of early passive solar design and reinforced, to some extent, by the "natural building" movement, which includes cob (mass adobe) cottages and straw-bale homes. However, this image is a narrow stereotype that doesn't begin to capture the scope or potential of green home-building. Most homes in the LEED for Homes pilot, in fact, are visually indistinguishable as "green homes," per se. Instead they are distinguished by intelligent design and quality construction that greatly reduce their environmental impacts as compared to their conventional counterparts.

Synopsis

- LEED for Homes is being developed to distinguish high-performance homes, which are designed and built to perform substantially better than conventional ones.
- The LEED for Homes pilot rating system rewards a wide range of features designed to reduce the "environmental footprint" of the home—to better steward and utilize the land on which it is built, save energy and water, make efficient and responsible use of materials, and provide a healthy indoor environment.
- Builders of green homes enjoy market distinction, improved risk management, and often premium prices.
- LEED Homes have their performance verified, which means that home buyers are assured of a superior product with tangible benefits including 30 to 70 percent energy savings, increased value, and healthier living.
- LEED for Homes is designed to be an agent for change, a harbinger of hope in the face of alarming global environmental trends.

	Conventional Home	LEED Home	Difference
Sticker Price	$ 300,000	$ 308,500	+$ 8,500
Monthly Mortgage	$ 1,439	$ 1,480	+$ 41
Monthly Energy Bill	$180	$126	-$54
Monthly Water Bill	$30	$20	-$10
Net Cost $ / Month	$ 1,649	$ 1,626	-$23
$ / Day			-$0.76

What's The Attraction?

The goal of a green home is to step more lightly on Mother Earth. The LEED for Homes pilot rating system, therefore, rewards a wide range of features designed to reduce the "environmental footprint" of the home—to better steward and utilize the land on which it is built, save energy and water, make efficient and responsible use of materials, and provide a healthy indoor environment. It also rewards builders who are constructing homes on "location-efficient" sites—that is, in locations that are near a variety of everyday needs and amenities and thus foster more energy—and resource—efficient lifestyles by encouraging walking and bicycling instead of the use of motor vehicles.

The tangible benefits to occupants of a LEED Home include reduced utility bills, cleaner indoor air, improved fitness (from increased walking and biking), and reduced likelihood of durability and other performance problems (e.g., moisture intrusion, mold, uneven heating and cooling, etc.). With major increases in energy prices expected this winter, most home buyers will be drawn to the highly energy-efficient home designs. For many others, the health benefits offer the greatest appeal. Asthmatics and others who suffer from environmental sensitivities may find that homes designed with improved air quality translate to better health and reduced medical expenses. And few among us would not benefit from a more active lifestyle.

Builders of green homes enjoy market distinction, improved risk management, and often premium prices. LEED Homes have their performance verified, which means that home buyers are assured of a superior product with tangible benefits including 30 to 70 percent energy savings, increased value, and healthier living. All this—and living more lightly on the planet!

What's The Cost?

Conventional wisdom has it that a green home carries a hefty price tag. Not necessarily so. As the table above illustrates, a LEED ("true green") Home can deliver sufficient improvement in energy and water efficiency to more than offset the nominal increase in sticker price, and includes all the other, harder-to-quantify, benefits of a LEED Home.

But Is It Really Green?

The LEED for Homes pilot rating system has been crafted as a "leadership standard," intended to recognize roughly the

25 percent of builders who employ the greenest building practices.

The green building industry, though diverse and rapidly evolving, is pretty well in agreement about the basics. Where performance thresholds are set, however, and which are the right green features are more subject to debate. Thus, when the USGBC set out to create LEED for Homes, the Council assembled a stellar committee of home-building and other technical experts from around the U.S. to take on the task of reaching consensus decisions about the issues.

LEED for Homes is also built on the broad shoulders of many groundbreaking and successful local, regional, and national programs, ranging from the venerable Austin Green Builder Program, to Built Green Colorado, to Vermont Builds Greener, to EarthCraft House in Atlanta, and to EPA's ENERGY STAR® Homes and DOE's Building America, among others. And the pilot rating system has undergone numerous drafts and review cycles with builders, the LEED Homes Committee, and additional technical experts.

The resulting LEED for Homes pilot rating system is the product of a hard-won consensus among numerous contributing organizations and individuals who collectively represent a number of large and technically savvy constituencies. This substantive strength is reinforced by the delivery mechanism, which employs third-party, on-site verifiers to ensure that LEED Homes are built to perform as intended, and an auditing procedure by the USGBC to further back up the credibility of the builders' claims regarding the "greenness" of the homes.

Who Is Building LEED Homes?

During the LEED for Homes pilot demonstration phase, 11 "Provider" organizations in different parts of the U.S. are working closely with selected builders of pilot LEED Homes. A complete listing of the pilot Providers and locations is available on the USGBC Web site at www.usgbc.org/leed/homes. Providers can be contacted to identify builders with whom they are working. The USGBC may consider expanding service into new areas midway through 2006. In early 2007, following approval of the rating system by the USGBC membership, the fully chartered rating system is expected to become available nationally. UHD

How Did LEED For Homes Come About?

The USGBC is self-described as "a coalition of the country's foremost leaders from across the building industry that promotes buildings that are environmentally responsible, economically profitable, and healthy places to live and work." Its LEED green building rating systems is the USGBC's principal tool in its efforts to transform mainstream building practices to more sustainable models, by rewarding and recognizing those who are developing the greenest buildings in the country.

Before tackling the development of the LEED for Homes pilot rating system, the USGBC focused exclusively within the commercial construction arena. Residential construction alone, though, represents roughly half of all construction activity, as measured in dollars spent. And there are nearly two million new housing units built each year, about 80 percent of which are single-family homes. So from a strategic perspective, the USGBC could hardly ignore home building for long.

The LEED for Homes pilot program was formulated under the same premise that has driven development of the other products in the LEED suite—that is, by offering an opportunity for builders and developers to distinguish their products from competitors through the achievement of a credible, tiered, third-party label, the USGBC is creating a market driver for higher levels of "green" performance. The program is intended to spur builders and developers to incorporate greater efficiencies in their projects.

What Types Of Homes Are Included?

The scope of LEED for Homes includes individual residential (or primarily residential) structures on individual sites. These may range from single-family detached homes to duplexes, row houses, townhomes, and multifamily structures up to three stories. For the initial phases of program development, the rating system will only address new construction; remodeling projects will be addressed in a later version of LEED for Homes or in an entirely new product, based on market needs.

The focus on new construction arose due to strategic reasons: the new construction market offers access to mainstream production home builders, who are responsible for an ever-growing segment of the home construction marketplace. Thus, LEED for Homes targets a builder audience that

includes a range from leading-edge quality production home-builders, through to innovative green custom builders and affordable housing developers.

Development Process

LEED for Homes differs from its antecedents—the home-building programs upon which it was based—in a number of ways. First, of course, it is intended to be both comprehensive of the full range of green building issues and national in scope, meeting a market need for builders in areas of the country that are not served by local and regional programs (the vast majority of the U.S.).

A fundamental issue the LEED Homes Committee faced was making the rating system and its delivery infrastructure accessible, relevant, and appealing to the target audience. This meant that it had to provide compelling value to both the builders and the home buyers, and it had to be user-friendly. And from the USGBC's perspective, the system had to have sufficient rigor for the Council to uphold its mandate of recognizing leadership in the marketplace.

The development of the rating criteria started with a consideration of the suitability of the overall LEED structure for the home-building arena. Were the LEED categories appropriate and workable? They were. The six existing LEED categories were used, and two new ones were added:

- Location and Linkages (new)
- Sustainable Sites
- Water Efficiency
- Indoor Environmental Quality
- Energy and Atmosphere
- Materials and Resources
- Homeowner Awareness (new)
- Innovation and Design Process

Another important early step was to investigate the range of existing local and regional green building programs and catalog the assessment measures used in those programs. This process yielded a master list of around 1,400 different measures, many of which were aimed at the same basic outcomes, but approached differently. They also represented a range in terms of rigor—some set thresholds higher or lower than others. The investigation of existing programs also examined the programs' structure—such issues as number of points, number of different evaluation measures, distribution across issues and categories, etc. The programs exhibited a very wide range across these parameters; the most dramatic range was number of points, which ranged from 65 to nearly 1,800. The LEED Homes Committee felt strongly that wide-spread acceptance meant that our program needed to be as lean as possible, which drove a very strategic focus.

The next step was to identify the primary strategies to be addressed in each LEED category and assign weights to them. These weights were then balanced across categories, targeting a 100-point total. The pilot version of LEED for Homes includes 108 points, which may be pared down to the targeted 100 post-pilot. Technical subcommittees then evaluated all the relevant measures in the master list of 1,400 and narrowed that list to include only those few that represented the appropriate level of rigor and best environmental "bang-for-the-buck" of builder effort.

Rating criteria were then drafted for each of these primary strategic areas, formulated to represent "best practices" in each area. Mandatory requirements were established based on the Committee's sense about what elements a home must have to be considered green, and what is economically feasible for builders to do. The rest of the system's rating measures are optional.

The pilot will be the final proving ground for the rating system before it is submitted to the USGBC membership in 2006 for comments. The committee will then refine the system based on the pilot experience and member input, and present it to the membership in early 2007 for approval. Following that approval, LEED for Homes will be made available across the U.S.

The LEED For Homes Pilot

The LEED for Homes pilot will continue throughout 2006. Once the pilot test is complete, the LEED for Homes system will be released for public comment, reviewed, and balloted by the USGBC membership. The official launch is expected during 2006.

The pilot will consist of two portions. The first, which will conclude mid-2006, is the data-gathering phase, during which the USGBC will be actively working with its pilot builders and program providers to critique and develop improvements to the rating system. The second portion will carry pilot builders over until the launch of the fully-chartered system, ensuring no interruption in builders' ability to participate.

The Structure Of LEED For Homes

Like the other LEED products, LEED for Homes has a four-tiered structure, with the different award levels based on points earned for incorporating various green design and construction measures in the home (along with the completion of the mandatory measures). Of the total of 108 points available, 30 are required at the lowest rating level—Certified, then 50 for Silver, 70 for Gold, and 90 for Platinum.

The basic unit of the rating system is called a "credit." A credit is a strategy or set of strategies with a common intent—that is, a particular environmental benefit those strategies are designed to achieve.

Beyond those fundamental structural similarities to its sister rating systems, LEED for Homes bears little resemblance. It is distinguished by a number of key features, described in the following paragraphs.

One intent, one credit. Within LEED for Homes, there is a one-to-one relationship between credits and intents, such that each action related to the improvement of lighting efficiency, for instance, resides in the same credit. A credit may include mandatory and/or optional elements. The mandatory ones, of course, must be completed in every LEED Home, and with one notable exception—home size (more about that later)—do not earn points. The builder may select from among the optional elements to earn the number of points needed for the desired rating level.

Integration with LEED for Neighborhood Developments (LEED-ND). LEED-ND is being developed in collaboration with the Natural Resources Defense Council and Congress for the New Urbanism to establish a definition of green neighborhood development that will be implemented nationally to foster the design of exemplary green developments. LEED for Homes foreshadows LEED-ND in the credits in the Location and Linkages category. The LEED-ND focus is on decisions made before construction on the location and type of site chosen for development.

Integration with successful ENERGY STAR Home programs. Home builders already face a sometimes dizzying array of marketing programs for their homes. Among the most successful of these is ENERGY STAR Homes, developed by the U.S. Environmental Protection Agency (EPA). Because the USGBC anticipates that the same builders who have embraced ENERGY STAR Homes will be the early adopters of LEED for Homes, it was important that these programs be integrated in order to ensure the highest level of acceptance among ENERGY STAR builders and ease their adoption of a new program. Thus ENERGY STAR Homes, along with its complementary sub-programs—the Indoor Air Package and the Advanced Lighting Package—are embraced within LEED for Homes. In practical terms, this means a builder of an ENERGY STAR Home automatically meets the mandatory measures in the Energy and Atmosphere category (and may earn up to 16 more points, depending on the home's HERS— Home Energy Rating System—score); using the Advanced Lighting Package earns an additional 3 points; and using the Indoor Air Package automatically meets the mandatory measures plus earns 10 points in the Indoor Environmental Quality category. (ENERGY STAR appliances can earn up to 3 more points.)

Regional variability: climate and precipitation zones. In the early stages of working on LEED for Homes, we heard over and over how important it was to be responsive to local conditions. This was a significant challenge for a national program, but respect for the inherently local nature of green building won out—to some extent, at least. LEED for Homes responds to local conditions in two ways: with climate zones and precipitation zones. The climate zones are in fact an integral part of the ENERGY STAR Homes program and are reflected in the credits based on that program. There are three precipitation zones: dry (0 to 20 inches annually), normal (20 to 40 inches), and wet (more than 40 inches). These affect the number of points available for credits related to landscape design, irrigation, and durability (protection from moisture).

Durability plan. Durability is another aspect of LEED for Homes that has been viewed as essential by all parties involved in its creation—and yet it has proven one of the most challenging to implement. This is because the set of appropriate design, specification, and construction measures for any individual home to foster durability depends on a large number of variables—site, climate, microclimate, exposure, natural disaster risks, orientation, soil type, building systems, etc.—which can occur in virtually infinite combination. Thus, the durability credit is structured to guide the builder through a decision-making process of identifying his or her risks and developing appropriate responses to those risks. The mandatory component of the credit is based on an "honor system" approach, simply requiring that the builder enumerate the durability measures incorporated in the home. The optional component of the credit includes third-party verification that the builder-identified durability measures were in fact incorporated.

Home size "carrot/stick." Unquestionably the most controversial credit in the rating system is the home-size credit. The exception to the mandatory/no points rule, this credit awards points to those who build homes smaller than the national average, and docks points from those who build larger homes. Although this approach violates LEED's generally benign "reward-only" philosophy, ultimately it was the only mechanism that the Homes Committee felt was both equitable and environmentally defensible. This credit carries a hefty weight because—although it resides in the Materials and Resources category—it also reflects energy impacts.

Affordable/multifamily basis for many credits. Affordable homes—and in particular, multifamily homes—typically represent a higher level of resource efficiency than their market-

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rate counterparts. Of course, this is for economic reasons; nevertheless, from the perspective of equity, this inherent efficiency could not be ignored. Credits that are based on these resource efficiencies include home size, location credits for infill and compact development, site credits exempting compact projects from landscaping and irrigation requirements, and a "gimme" air quality point for no attached garage (no attached garage = avoiding vehicle emissions infiltrating into living space).

National third-party verification and rating service network. If the USGBC is successful in attracting even a very small portion of the 2-million-unit-per-year homes market, the USGBC's existing rating infrastructure easily could be swamped, jeopardizing both LEED for Homes and the Council itself. Thus, it was imperative that not only a new rating system be developed, but also a new infrastructure for serving participating builders. The USGBC, consequently, has formed a strategic alliance with the Residential Energy Services Network (RESNET, www.natresnet.org), tapping into the existing community of HERS raters throughout the U.S. to provide verification services to builders of LEED Homes.

Making The Case For LEED For Homes

One of the largest hurdles yet remains before the USGBC —marketing LEED for Homes successfully to mainstream builders. The marketing effort will rely substantially on effective communications strategies; but those strategies will need to be founded on compelling information. Perhaps the most compelling angle to the LEED for Homes story is the one based on cost and return. The table on page 51 tells this story: a LEED Home delivers sufficient improvement in performance to more than offset the increased sticker price, while delivering improved indoor environmental quality, reduced likelihood of durability problems, verified performance, and a smaller environmental footprint.

There is ample evidence in market studies that there is already considerable consumer interest in homes that fulfill this promise. That interest will only increase in years to come, as energy and water prices continue to escalate and concerns about national security and climate change come ever more to the fore.

LEED for Homes is designed to be an agent for change, a harbinger of hope in the face of alarming global environmental trends. It represents the passionate work of an extraordinarily dedicated and talented corps of both paid and volunteer experts, our best guess about what will work in a large and complicated market. We now look to the builder and home-buyer communities to critique LEED for Homes and help us improve on this first, monumental, effort. UHD

The Authors

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Jay Hall, PhD, has been consulting with the USGBC on the development of LEED for Homes for the past two years. His background includes 20 years developing voluntary market transformation programs including several of the U.S. EPA's ENERGY STAR initiatives and Fannie Mae's Emissions Trading Initiative. Since 1995, he has managed the consulting team that developed and supported the EPA's ENERGY STAR for Homes program. Jay resides in Annapolis, Maryland and can be reached at Building Knowledge, 410 263 3162 or jay@buildingknowledge.net.

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This is a unique point in the history of human shelter. We are the first generation with the opportunity to integrate information technology (IT), smart design, and sustainability into our homes. Capturing the benefits of these advances can be challenging for forward-looking homeowners due to steep learning curves, unproven systems, and increased costs. Fortunately, there are tools in the marketplace to help. One example is the world's most recognized eco-label: ENERGY STAR®, the national symbol for energy efficiency. What many consumers don't know is that ENERGY STAR typically identifies the most advanced technologies in each product category that delivers superior quality through stringent specifications set by the U.S. Environmental Protection Agency (EPA) and Department of Energy (DOE). Energy-efficiency is considered by many building professionals to be the single smartest green-design feature for any home. This is because it delivers large environmental benefits AND pays the homeowner back in reduced utility bills.

The U.S. EPA is pleased to provide an overview of the ENERGY STAR program for the Premiere Issue of *Ultimate Home Design*. We are grateful to the editor for the opportunity to report on and share several new residential initiatives, and we look forward to reader feedback.

"What most consumers don't know is that ENERGY STAR typically identifies the most advanced technologies in each product category that delivers superior quality through stringent specifications..."

History Of ENERGY STAR

The EPA established the voluntary ENERGY STAR program in 1992, and has partnered with the DOE since 1996 to increase nationwide use of energy-efficient products and practices. The first voluntary labeling program for computers was also started in 1992; the program now qualifies energy-efficient products in multiple categories, in addition to new homes, home-improvement services, commercial buildings, schools, hospitals, hotels, and small businesses. The ultimate objective of the program is to reduce greenhouse gas emissions. In 2004 alone, the program saved $8 billion in energy costs, prevented greenhouse gas emissions equivalent to that of 18 million cars, and saved enough energy to power 20 million homes. To date, more than 1 billion ENERGY STAR-qualified products have been purchased.

Efficient, sustainable design is finally gaining a well-deserved foothold in the residential sector. As this article goes to press, energy prices have reached an all-time high, due to the aftereffects of hurricanes Katrina and Rita, and winter heating costs are expected to be twice as expensive, or more, than they were last year. For the first time since the California energy crisis, consumers are becoming interested in energy efficiency, with leading companies responding to this trend. Energy demand and emissions will continue climbing over the next 20 years, driven by increasing demand in both the residential and commercial sectors. These developments point to a future where efficiency becomes an integrated part of every intelligent home.

Synopsis

- Energy-efficiency is considered to be the single smartest green-design feature for any home because it delivers large environmental benefits AND pays the homeowner back in reduced utility bills.
- The EPA and DOE use ENERGY STAR to label and qualify products in more than 40 product categories ranging from office equipment to HVAC systems and electronics to lighting.
- ENERGY STAR-qualified homes are independently verified to be at least 30 percent more energy efficient than homes built to the 1993 national Model Energy Code or 15-percent more efficient than the state energy code, whichever is more rigorous.
- Savings are based on heating, cooling, and hot water energy use achieved through a combination of building envelope upgrades, high-performance windows, controlled air infiltration, upgraded heating and air conditioning systems, tight duct systems, and upgraded water-heating equipment.

Efficient By Design

The EPA and DOE label and qualify products in more than 40 product categories ranging from office equipment to HVAC systems and electronics to lighting. Many products such as HVAC systems, appliances, light fixtures, ceiling fans, and vent fans are often specified in new construction/renovation, and it is the EPA's hope that the market will quickly transform in these categories.

Lighting, especially, represents a large and growing product category, which offers tremendous potential for environmental benefits and energy savings. In 2004, the EPA began promoting an ENERGY STAR Advanced Lighting Package (ALP), which defines a set of energy-efficient, hard-wired fixtures intended for new homes. Fixtures that earn the ENERGY STAR use two-thirds less energy, while guaranteeing instant start, good color rendering, and no annoying flicker or hum. One builder, D.R. Horton in Sacramento, California, includes the Advanced Lighting Package as a value-add in selected developments, which the company believes increases profitability, quality, and quick home sales. Built-in from the start, efficient lighting design rewards new homebuyers with both energy savings and environmental protection.

The growth of electronics and IT equipment in the home is another key factor affecting home energy performance, motivating the EPA toward stricter voluntary criteria for certain products. Residential electricity use for electronics/IT has doubled since the late 1990s and is responsible for up to 15 percent of household electricity use. By 2015, electronics and related products will account for as much as 33 percent of household electricity use. Several factors are causing this trend: high consumer demand for entertainment and multiple modes of communication; increased entertainment options and availability—online music, MP3 players, DVD/DVR, Internet, home theatre, and large widescreen televisions; lower price points for new products and rapid obsolescence of old ones; and demand for mobile, handheld products—and proliferation of companion power adapters/battery chargers. Other miscellaneous products—such as microwaves, toaster ovens, coffeemakers, and home-security systems—add to the plug load, and their sales have doubled in the past five years.

There are obvious risks associated with these trends, namely, higher environmental costs related to power consumption, and higher—but not so obvious—household utility costs borne by homeowners. Energy used and utility costs paid for connectivity, convenience, and entertainment is now many times the amount we spend, say, to run a new refrigerator for an entire year. The opportunities lie, first, in more efficient

product design, across multiple modes of product operation (on, off, standby), and second, in more intelligent and integrated home design that factors in multiple products operating at many levels. The EPA is leading efforts to address both issues, so that consumers can continue to enjoy the best technologies, while relying on less energy.

Improving And Remodeling Existing Homes

Home improvement (for existing homes) was the next opportunity the EPA identified to help consumers save energy and achieve better efficiency and comfort. Established in 2002, the ENERGY STAR Home Improvement Program focuses on home sealing—one of the most cost-effective ways to lower energy bills and improve comfort—and offers step-by-step guidance for sealing air leaks and adding insulation. For homeowners who require professional help, the EPA also offers recommendations for finding a contractor who can provide this service.

Pulling energy-efficiency improvements together in a comprehensive package is a new service called “Home Performance With ENERGY STAR.” This whole house improvement program (designed for existing, not new, homes) emphasizes home diagnostics and evaluation, improvements made by trained technicians/building professionals, sales training, and a strong quality assurance component. Working with a professional home performance contractor or consultant, homeowners determine the most cost-effective path to improving their home’s energy efficiency. Using diagnostic equipment, the contractor will test and evaluate the home and recommend a set of comprehensive improvements. Rather than focusing on a single part of the home, Home Performance looks at how improvements to insulation, air sealing, and HVAC can work together to give the best results. Once the homeowners select the options that fit their needs and budget, an accredited contractor makes sure the work is properly completed. Home Performance is currently offered in several markets, sponsored typically by a utility company, state agency, or local association. So far more than 11,000 homes have been upgraded through this program.

Sixty-five percent of American homeowners undertake home-improvement projects each year, and it’s never too late to incorporate energy-efficient and/or green-building improvements. In fact, remodeling presents the ideal time to make these changes.

Building From The Ground Up

Finally, ENERGY STAR’s new homes program continues to grow. More than 2,500 homebuilders have built 500,000 qualified homes, which meet the EPA’s criteria for efficiency, saving over $120 million in energy costs. ENERGY STAR-qualified homes are independently verified to be at least 30 percent more energy efficient than homes built to the 1993 national Model Energy Code or 15 percent more efficient than state energy code, whichever is more rigorous. These savings are based on heating, cooling, and hot water energy use and are typically achieved through a combination of:

- building envelope upgrades
- high-performance windows
- controlled air infiltration
- upgraded heating and air conditioning systems
- tight duct systems
- upgraded water-heating equipment

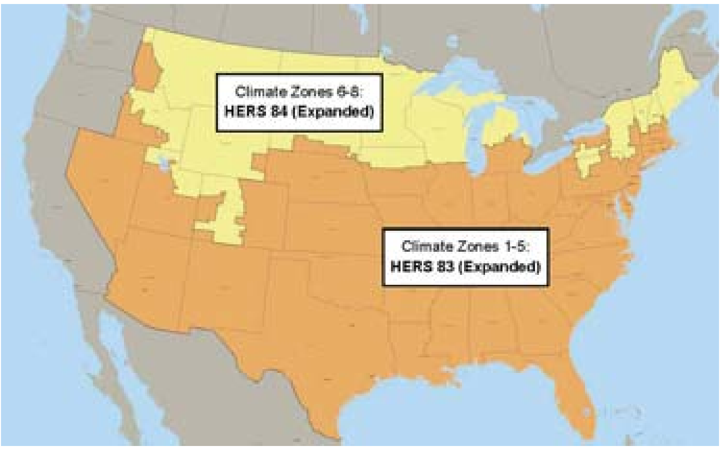
These features contribute to improved home quality and homeowner comfort and to lower energy demand and reduced air pollution. ENERGY STAR also encourages the use of energy-efficient lighting and appliances, as well as features designed to improve indoor air quality.

In 2004, qualified homes represented approximately 10 percent of all housing starts nationally, and 50 percent of new construction starts in Las Vegas, Phoenix, Houston, and Dallas. The EPA intends to collaborate with homebuilders to build, test, and label over 150,000 additional new homes in 2005/2006, and extend outreach to six new markets.

States’ adoption of the International Energy Conservation Code (IECC) and revised standards for air conditioner efficiency prompted the EPA to revisit the ENERGY STAR-qualified home guidelines in 2005. Development of the guidelines, which had remained unchanged since the program began over 10 years ago, was a yearlong effort and included significant input from industry partners and other stakeholders. Again, the EPA had the opportunity to develop homebuilding criteria that would significantly improve efficiency over prior criteria. Released in September 2005, the new criteria significantly raises the bar for ENERGY STAR-qualified homes, which must be at least 15 percent more energy efficient than homes built to the 2003 IECC. Depending on the area of the country, this represents a 50 to 100 percent improvement over previous guidelines.

The EPA criteria are based on two different paths: the Performance Path (A Home Energy Rating), or the Prescriptive Path (A Builder Option Package).

Under the Performance Path, a home must be verified and field-tested to meet a minimum Expanded HERS (Home Energy Rating System) score of 83 (in Climate Zones 1 to 5) or 84 (in Climate Zones 6 to 8). The home must also meet the following minimum requirements: Thermal Bypass Inspection Checklist completed; duct leakage tested at 6 cfm to



outdoors/100 square feet; and include at least one ENERGY STAR-qualified product category (e.g., heating or cooling equipment, windows, or five or more qualified light fixtures, appliances, ceiling fans equipped with lighting fixtures, and/or ventilation fans).

Under the Prescriptive Path, a home must be built to requirements specified in the ENERGY STAR Builder Option Package (BOP) and field-tested. BOPs can simplify the process of constructing a qualified home by providing a set of construction specifications that will enable the home to qualify for the label. The new BOP specifies the following requirements: Properly-sized ENERGY STAR-qualified heating or cooling equipment (climate-zone dependent); ENERGY STAR-qualified windows; energy-efficient hot water heating; insulation levels that meet or exceed the 2004 IRC; duct leakage tested at 4 cfm to outside/100 square feet and minimum R-6 insulation on ducts in unconditioned spaces; envelope infiltration below specified limits (varied by Climate Zone); a completed Thermal Bypass Inspection Checklist; and five or more ENERGY STAR-qualified appliances, light fixtures, ceiling fans equipped with lighting fixtures, and/or ventilation fans.

The new guidelines take effect on July 1, 2006. Homes enrolled in a utility or state-based efficiency program by December 31, 2005, or those permitted by July 1, 2006, can use the previous guidelines. Notwithstanding this transition period, all homes that earn the ENERGY STAR label on or after January 1, 2007 must use the new guidelines.

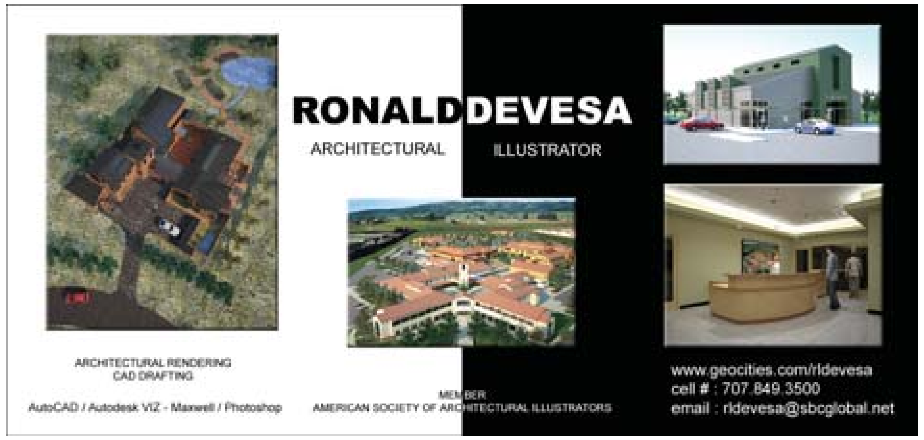
As always, the new homes program gives builders access to a variety of technical and marketing tools, including listing on the ENERGY STAR partner locator, special awards and recognition from the EPA, and opportunities to participate in locally sponsored ENERGY STAR outreach campaigns. And because ENERGY STAR-qualified homes improve homeowner comfort and reduce utility bills, builders often find that their participation in the program results in increased levels of consumer satisfaction.

Conclusion

The EPA believes the future is ripe for intelligent, efficient home design, and growth of energy-efficient products, practices, and services in the residential sector. For more information on all of ENERGY STAR’s program offerings for consumers and industry partners, visit www.energystar.gov. UHD

The Author

Jill Abelson is a Communications Manager for the Environmental Protection Agency’s ENERGY STAR Program. She oversees national outreach aimed at transforming the market toward energy efficiency in multiple product categories, and has played a key role in product launches, marketing, branding/communications, and industry partnerships. She can be reached at abelson.jill@epa.gov.



Circle #16 In Advertisers’ Index For Information

BUILDING on the past

Photo courtesy of Elmwood Reclaimed Timber

Whether they're salvaging wood from an old barn or recovering logs from a river, reclaimed wood flooring manufacturers are taking what's old and making it new again. The distinctive look of reclaimed floors are making them a popular option for both environmentally-aware and design-conscious consumers. To help sort out the increasing number of options on the market, *Hardwood Floors* presents its exclusive Reclaimed Wood Flooring Product Focus charts.

REPRINTED FROM THE AUGUST/SEPTEMBER 2005 ISSUE OF *Hardwood Floors*

A NEW WOOD FLOOR SHOULD BE AT LEAST TWO HUNDRED YEARS OLD

Southern Wood Floors harvests buildings, not trees, to make antique heart pine. Beams and timbers of historic wood from 18th– and 19th–century structures are meticulously milled for precision floors, walls and cabinet stock. A rich, noble wood more than 200 years old, and a perfectly renewed resource for any old house.

SOUTHERNWOODFLOORS

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WWW.SOUTHERNWOODFLOORS.COM

Circle #17 In Advertisers' Index For Information

REPRINTED FROM THE AUGUST/SEPTEMBER 2005 ISSUE OF *Hardwood Floors*

TYPE OF FLOORING	Solid	Engineered	Parquet	SPECIES: Oak	Beech	Chestnut	Cypress	Douglas fir	Hemlock	Pine	Heart pine	Poplar	Teak	Walnut	Ash	Hickory	Maple			
Ackerson-Stevens Inc. • Circle 200																				
Recycled Heart Pine Flooring	•										•							¾	2⅛-7⅛	4 grades available: Antique, Plantation, Colonial, Cabin
Acorn Millworks Inc. • Circle 201																				
Reclaimed Douglas Fir	•							•										½,¾	2¼-6	
American Heart Pine • Circle 202																				
Washington (American Heart Pine)	•										•							¾	3-10	Also available in vertical grain; 95-100% heartwood
Appalachian Woods LLC • Circle 203																				
Antique Timber Sawn	•			•		•		•		•	•			•		•		¾	3-10	Manufactured from salvaged timbers that have been sawn into usable lumber
Antique Barn Board	•			•		•			•	•								¾	3-16	Manufactured from original planks salvaged from old barns
Authentic Pine Floors Inc. • Circle 204																				
American Spirits	•	•								•	•							¾ solid, 9/16 eng.	3-9	American-grown heart pine reclaimed from demolished structures; prefinished or unfinished
Balsam Creek Woodworks • Circle 205																				
	•			•	•			•	•	•					•		•	¾	3-12	All orders custom-crafted on individual basis; other species available
Birch Creek Millwork • Circle 206																				
Texturewood	•			•				•		•	•			•	•	•		¾	random	Planks machine- and hand-textured; 3-D, circlesawn, skipsawn; hand-scraped
Carlisle Wide Plank Floors • Circle 207																				
	•			•														¾	3-10+	Lengths: 3-14'; reclaimed from old barns
	•										•							¾	3-12	Lengths: 4-16'; reclaimed from old mills and factories
	•					•												¾	3-10+	Lengths: 3-14'; light cocoa to dark brown tones
Castle Flooring • Circle 208																				
	•	•	•	•		•		•	•		•		•			•		½,¾	1½-11¼	Custom orders include hand-distressing and custom finish
Centre Mills Antique Floors • Circle 209																				
	•			•		•	•		•	•	•	•		•		•		5/8,¾,1,5/4,6/4	2½-14	Random widths
Century Wood Products Inc. • Circle 210																				
	•			•	•	•		•	•	•	•				•		•	¾	4-12	
The Charleston Bay Co. Inc. • Circle 211																				
Hampton and Battery	•										•							¾	3-11	
Chestnut Specialists Inc. • Circle 212																				
Remilled Antique Flooring	•			•		•				•	•							¾	4-16	Reclaimed from antique barn lumber; square edge, tongue and groove; kiln dried

TYPE OF FLOORING	Solid	Engineered	Parquet	SPECIES: Oak	Beech	Chestnut	Cypress	Douglas fir	Hemlock	Pine	Heart pine	Poplar	Teak	Walnut	Ash	Hickory	Maple			
Cochran's Lumber and Millwork • Circle 213																				
Tobaccowood Pine	•									•								¾	3-11	Available distressed; knots, nail holes and character vary
Antique Heart Pine	•										•							¾	3-12	Grades are Select, Cabin and Vertical Grain; made fron century-old buildings
Wormy Oak	•			•														¾	3-9	Mix of red and white oak; random widths
Horse Country Oak	•			•														¾	4½	Mix of red and white oak; medium to high knot content with black patina
Antique Chestnut	•					•												¾	3-10	Made from structures built before early 20th century; color, knots, nail holes vary
Antique Oak	•			•														¾	3-11	Mix of red and white oak; recycled from old barn structures; rustic character
Curtis Lumber & Manufacturing • Circle 214																				
Classic Heart Pine	•	•								•	•							¾,9/16	3⅛-10⅞	3⅛" and 5⅛" usually in stock

Fontenay Woods

Forest Floor

Fulford Flooring

Goodwin Heart Pine

Harvest Timber

Heartpine Products

Heartwood Pine Floors

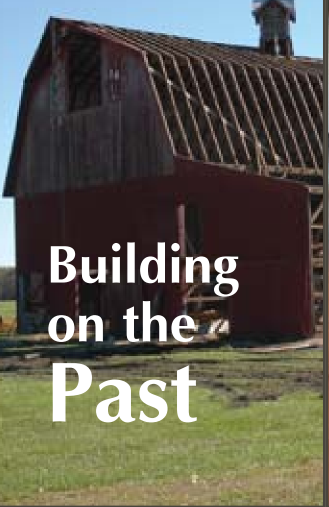
Henderson Corp.

J.L. Powell

Longleaf Lumber

	TYPE OF FLOORING			SPECIES																			
	Solid	Engineered	Parquet	Oak	Beech	Chestnut	Cypress	Douglas fir	Hemlock	Pine	Heart pine	Poplar	Teak	Walnut	Ash	Hickory	Maple			
EcoTimber • Circle 215																				
EcoTimber Rustics	•			•							•							¾	3-11	
Elmwood Reclaimed Timber • Circle 216																				
	•			•		•	•	•		•	•			•	•	•	•	½,¾	up to 12+	Also elm, cherry, redwood, sycamore; custom millwork, molding, stair parts; kiln-dried; 7 grades
Fontenay Woods Inc. • Circle 217																				
Vintage Barrel Collection	•			•														⅜	1-5	Random widths; made from reclaimed wine barrels; quartersawn, clear grade
Forest Floor • Circle 218																				
Virgin Growth Flatback	•			•	•											•		¾	1½,2¼	Also yellow birch; new tongues and grooves; northern old-growth timber
Antique Hand Scraped	•																•	¾	2¼	Also yellow birch; tops planed clean; patina, highly figured; northern old-growth timber
Foster Wood Products Inc. • Circle 219																				
	•			•		•	•	•		•	•	•						½-2	2-8½	Some widths are 12″
Fulford Flooring • Circle 220																				
	•			•		•					•			•				¾	2-10	
Goodwin Heart Pine Co. • Circle 221																				
Character	•	•					•				•							¾ solid, 9/16 eng.	varies	Widths: solid 2¼-9, eng. 3½-7½; 75-98% heartwood; 200+ year-old heart pine; 1000-year-old cypress
River Recovered®	•	•					•				•							¾ solid, 9/16 eng.	varies	Widths: solid 2¼-9, eng. 3½-7½; 100% heartwood; 8+ growth rings per inch
Legacy	•	•									•							¾ solid, 9/16 eng.	varies	Widths: solid 2¼-9, eng. 3½-7½; 98% heartwood; 6 growth rings per inch; reclaimed from old warehouses
Midnight	•						•				•							¾	2½,3¼,5¼	100% heartwood; at least 200 years old; milled from pilings put in Savannah River during 1700s
Guangdong Yihua Timber Industry Co. Ltd. • Circle 222																				
Germany Wild Production Line	•	•		•	•							•	•	•			•	½,7/10	3½,4⅘,7⅖	
Halm Lumber Company • Circle 223																				
	•			•			•											⅜,½,¾	3-12	
Harvest Timber Co. • Circle 224																				
Pioneered Wood	•			•														¾	random-7	Character grade; long lengths
Hearne Hardwoods • Circle 225																				
	•					•					•							¾	3,4,5,6,7	
Heartpine Products • Circle 226																				
	•		•								•							⅜,½,¾,1,1¼	2-14	Moldings, stair treads, risers, handrails, nosing and returns also available
Heartwood Pine Floors Inc. • Circle 227																				
	•										•							½,¾	2-7	100% reclaimed heartwood; quartersawn, plainsawn; precision-milled; random lengths 1-10′
Henderson Corporation • Circle 228																				
Antique Reclaimed Series	•			•	•	•		•	•	•		•				•	•	¾	3-18	Available in "patina" distressed, "natural sawn," and "worn finish"
J.L. Powell & Co. Inc. • Circle 229																				
The Charleston	•										•							¾	2-5 random	Formal; 100% quartered rift and clear; 100% heart face; random lengths 1-12′
The Savannah	•										•							¾	2-5, 3-7	Traditional; mix of plainsawn, quartersawn; 98% heart face; random lengths 1-12′
The Camden	•										•							¾	2-5, 3-7	Casual; plainsawn; 85% or higher heart face; nail holes, knots; lengths 1-12′
Naily Heart	•										•							¾	2-5, 3-7	Rustic; mix of quartersawn, plainsawn; 95% or higher heart face; nail holes, knots
Big Naily	•										•							¾	2-6 random	Rustic; mix of quartersawn, plainsawn; 95% or higher heart face; large nail holes

Building on the Past



Manomin Resawn Timbers

Mountain Lumber

New Beginnings

Nordic American

Pioneer Millworks

RW Rhine

Rooster Head

Scotland Neck

SouthFloor

	TYPE OF FLOORING			SPECIES																
	Solid	Engineered	Parquet	Oak	Beech	Chestnut	Cypress	Douglas fir	Hemlock	Pine	Heart pine	Poplar	Teak	Walnut	Ash	Hickory	Maple			
J.L. Powell & Co. Inc. (Cont.)• Circle 229																				
Antique Heart Pine Oily	•										•							¾	2-9 random	Rustic; 100% reclaimed heart pine; oily texture; random lengths 1-12′
Plantation Plank	•										•							9/16,¾	2-5,3-7	Rustic; 100% reclaimed heart pine; 85% heart face; random color, knots
Antique Pine Plank	•									•								¾	2-6 random	Rustic; 100% reclaimed heart pine; 25% heart content; random nail holes
Riverwood Plank	•										•							¾	2-7random	Rustic; river-recovered; color variations; random knots; random lengths 1-12′
Reclaimed Douglas Fir	•							•										¾	2-7random	Traditional; dense-grained, small knots; occasional nail holes; random lengths 1-12′
John Cox Lumber Co. • Circle 230																				
Circa Flooring	•			•		•	•	•		•	•		•	•	•	•	•	½,¾,1	1½-11	All material kiln-dried
Longleaf Lumber LLC • Circle 231																				
	•			•	•	•				•	•						•	¾,13/16	2½+	Custom milling available
Manomin Resawn Timbers • Circle 232																				
	•			•				•		•						•		¾	5-16	Douglas fir available up to 16+ wide; 4-16′ long
Mountain Lumber • Circle 233																				
Custom Wide Plank	•										•							¾	12+	Rare collection of wide historic heart pine planks
Granary Oak®	•			•														¾	3-7	Character-grade oak with natural patina and original saw marks
Antique American Oak	•			•														¾	3-10	Blend of antique red and white oak with distinctive natural variations
Authentic Distressed	•										•							5/8	3-10	Rich, natural character from a century of exposure; deep patina and original saw marks
Historic Heart Pine®	•										•							¾	3-12	Available in a variety of grades from formal (rift) to casual (farmhouse)
European Cooper's Oak™	•			•														9/16	3-6	Reclaimed from 100-year-old English cider vats; distinctive colors and cooper's wedge details
Ancient Chinese Elm	•																	¾	3-10	Elm reclaimed from 400- to 600-year-old buildings in China; rich butterscotch and chocolate markings
Pelzer Maple	•																•	5/8	2¼	Antique "hard" maple rescued from a landmark South Carolina mill
Antique American Chestnut	•					•												5/8	3-18	Rare wood with natural character not found in modern forests
New Beginnings • Circle 234																				
	•			•	•	•		•		•	•			•		•	•	¾	3-11	Long lengths; wide widths; finished or unfinished available
Nordic American • Circle 235																				
Nordic Reclaimed Maple	•																•	¾	2¼,3¼	Reclaimed maple mill flooring showing patina and wear marks
Rappgo Heart Plank		•									•							9/16	5½,8	Can be nailed, stapled, glued or floated; unfinished, prefinished, oil-finished
Pioneer Millworks • Circle 236																				
American Gothic	•			•	•	•								•	•	•	•	¾	3-14	Resawn from salvaged barn beams; prefinished available
Attic Collection	•							•	•	•								¾	3-16	Mixture of reclaimed softwoods; prefinished available
Quality Woods Ltd. • Circle 237																				
	•		•										•					5/16,½,5/8,¾	2¼,3¼,5⅝	Manufactured from 100- to 200-year-old logs salvaged from Burma River
R.W. Rhine Inc. • Circle 238																				
	•							•										¾	3,5,7	Nail holes, black iron marks and seasoning checks typical; 2″-16′ lengths
Rooster Head Antique Heart Pine • Circle 239																				
	•										•							¾-1		Stair parts, beam work available
Scotland Neck Heartpine Inc. • Circle 240																				
Reclaimed Antique Heart Pine	•										•							½,¾	2½-8½	Perfection quartersawn, select quartersawn, select plainsawn, character grades

REPRINTED FROM THE AUGUST/SEPTEMBER 2005 ISSUE OF *Hardwood Floors*

Southern Wood Floors

Superior Hardwoods

Terramai

Timeless Timber

Vintage Lumber

Waverly Wood Flooring

Wood Flooring Intl.

Woodland Flooring

The Woods Co.

Yesteryear Floorworks

	TYPE OF FLOORING			SPECIES																
	Solid	Engineered	Parquet	Oak	Beech	Chestnut	Cypress	Douglas fir	Hemlock	Pine	Heart pine	Poplar	Teak	Walnut	Ash	Hickory	Maple			
SouthFloor • Circle 241																				
Antique Reclaimed Heart Pine	•										•							3/4	3-10	Available in 4 grades; site-finished; 95-100% heartwood
Engineered Antique Heart Pine		•									•							9/16	7 5/8	Wide plank; 95-100% heartwood; 25-year finish warranty
Southern Wood Floors • Circle 242																				
Antique Reclaimed Heart Pine	•										•							3/4	3-10	Available in 4 grades; site-finished
Engineered Antique Heart Pine		•									•							9/16	7 5/8	Wide plank; 25-year finish warranty
Sticks and Stones Dist. Inc. • Circle 243																				
Appalachian Plank Flooring	•						•				•		•					3/4	2 1/4-7	Kiln dried to 6-8%; end-matched
Superior Hardwood and Millwork • Circle 244																				
	•			•	•	•		•		•	•					•		3/4	4-14	
Terramai • Circle 245																				
Reclaimed Tropical Hardwood	•							•					•					5/8	2-7	All products from post-consumer reclaimed and salvaged wood sources
Timeless Timber Inc. • Circle 246																				
Historic Timeless Timber Flooring	•			•	•	•	•			•						•	•	15/16	random	Also Ponderosa pine; custom thicknesses; random lengths; 100% SCS-certified; water-salvaged virgin-growth
Historic Ageless End-Grain Blocks	•			•													•	3/4	4x4,6x6	Also red birch; 100% SCS-certified; water-salvaged virgin-growth hardwoods and softwoods
Top Grade Floors • Circle 247																				
	•			•		•				•						•	•	1/2,3/4	3-10+	Circlesawn, hand-planed, brushed and distressed available in some species
Triton International Woods • Circle 248																				
Solid Plank Collection	•							•		•	•						•	3/4,1	3-12	Reclaimed maple mill flooring; reclaimed antique beams and posts
Vintage Hardwoods • Circle 249																				
	•			•		•				•	•	•				•		1/2,3/4	3-8	
Vintage Lumber • Circle 250																				
Whiskey Springs Plank	•			•						•								3/4	2 1/4-16	All random-width flooring (3-8″) is end-matched in random lengths of 2-10′
The Vintage Collection	•			•		•			•	•	•			•		•		17mm	2 1/4-16	Original faced/rough-sawn remilled flooring; all flooring from 50- to 200-year-old buildings when razed
Waverly Wood Flooring • Circle 251																				
Antique Heart Pine		•									•							1/2	2 1/4,3,5	Available hand-scraped and smooth; aluminum-oxide finish with 25-year warranty; 200+ years old
Wickham Hardwood Flooring • Circle 252																				
Signature	•			•	•									•	•	•	•	3/4	2 1/4-5	100% integrated manufacturer; many stains available
Wood Flooring International • Circle 253																				
The American Woods Collection		•		•										•			•	9/16	3,5	Also cherry, both red and white oak; 25% reclaimed from post-industrial waste
Woodland Wide Plank Flooring Co. • Circle 254																				
	•							•		•								3/4	5 1/4,7	Prefinished with OSMO Hardwax oil; FSC-certified or rediscovered-certified sources; underwater salvaged
The Woods Company • Circle 255																				
	•			•		•			•	•	•			•		•	•	3/4	3-16	Reclaimed from barns, mills, other rural buildings; custom millwork, stair parts, decorative beams
Yesteryear Floorworks • Circle 256																				
Aged Woods®	•			•		•				•	•					•	•	1/2,3/4	3-12+	Stair parts, moldings, dimensional; kiln dried; end-matching, beveling available
Bunkhouse Plank®	•			•						•								3/4	3-10+	Stair parts, moldings, dimensional; kiln dried; end-matching, beveling available

FindSolar.com: find solar professionals

"...solar-power generating and water-heating system costs have steadily declined, system quality and reliability have improved, many financial incentives have become available, and the field of renewable energy professional services has expanded and matured."

Scott Cronk

Synopsis

- FindSolar.com's mission is to serve as a convenient, user-friendly means for owners of homes and small commercial buildings to evaluate solar-energy systems and find qualified professionals to install and service these systems.
- By enabling visitors to rate the service provided by solar professionals, FindSolar.com allows solar-system owners to communicate their experiences and share them with those considering an installation.

A New Web Site

Renewable energy is finding its way into the lives of many Americans, both through "green energy" purchases and an increasing number of home- and building-system installations. For others, renewable energy remains a futuristic idea whose practical application can be intimidating. A new Web site, www.FindSolar.com, aims to change that.

In recent years, solar-power generating and water-heating system costs have steadily declined, system quality and reliability have improved, many financial incentives have become available, and the field of renewable energy professional services has expanded and matured. FindSolar.com puts consumers in touch with these realities through innovative Web-based tools and database-driven resources.

Matching Homeowners With Solar Pros

Funded under a five-year Department of Energy (DOE) grant, FindSolar.com is being developed and administered through an alliance led by the American Solar Energy Society (ASES), in partnership with the Solar Electric Power Association (SEPA), the DOE, and Energy Matters, LLC. The site's Advisory Panel includes industry and technology specialists, contractors, utility personnel, and consumers.

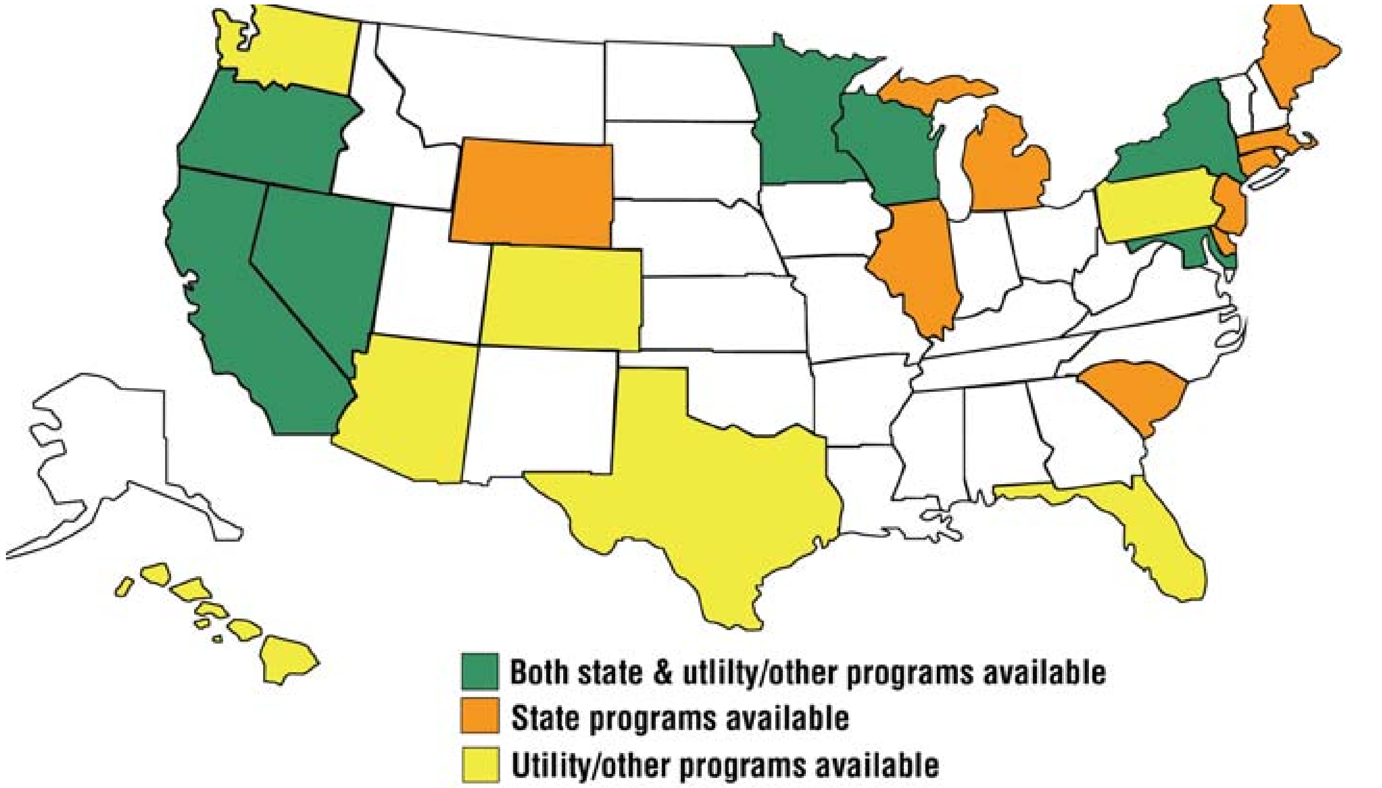
FindSolar.com's mission is to serve as a convenient, user-friendly means for owners of homes and small commercial buildings to evaluate solar-energy systems and find qualified professionals to install and service these systems. The site assembles national and region-specific solar programs and utility information into an array of online tools and content:

- "Solar Estimators" to help people estimate the costs and benefits of solar-electric and solar-thermal energy systems for their particular locations and building needs.
- A trusted means by which consumers can access and evaluate solar-energy contractors and professional services.
- Links to and resources about solar-energy data, programs, and other helpful information.

For Consumers, Hands-On Solar Tools

The solar-energy industry has many success stories, and FindSolar.com puts consumers in touch with this experience. By enabling visitors to rate the service provided by solar professionals, FindSolar.com allows solar-system owners to communicate their experiences and share them with those considering an installation.

Utility rates and metering options vary from utility to utility and from state to state, as do solar incentive programs. FindSolar.com offers online cost-estimator tools backed by extensive databases of cost and incentive information. These tools cover solar electric (photovoltaic), solar



A Snapshot Of Solar-Incentive Programs

• Solar purchase incentive programs are offered in 23 states.

• Starting in 2006, solar systems installed on homes are eligible for federal tax credits, and commercial installations qualify for accelerated depreciation.

• 21 states offer state tax credits or deductions for investments in solar systems.

• 27 states allow solar systems to be exempt from property tax assessment.

• 19 states exempt solar system purchases from sales tax.

Homeowners: Find Resources

As a consumer, you'll find a wealth of information at FindSolar.com.

Use the solar estimators to help you determine the cost and benefits of installing solar-electric or solar-thermal systems on your home or building.

View profiles and reviews of solar professionals that can service your needs in your specific geographic location. And, FindSolar.com will even send emails to solar professionals you choose so the site assessment and bidding process can begin.

Find "Pre-Screened" solar professionals. This can help you, as a consumer, determine which solar professionals may be best suited to your needs.

Learn about the main, important steps you, as a consumer, need to understand to maximize your experience and your return on investment. Get prepared by learning about important steps involved when installing solar systems.

FindSolar.com also offers online links, resources, and a database of Frequently Asked Questions (FAQs).

water-heating, and solar pool/spa-heating applications. Solar space-heating/ cooling applications will also be added to FindSolar.com's online estimator tools. These estimators are user-friendly, requiring only minimal data input from the user to calculate local cost and benefit ranges for a planned system. They deliver easy-to-understand explanations of how one can maximize solar return on investment, minimize up-front costs, and enjoy years of clean, reliable energy produced on-site. In future years, FindSolar.com will provide design assistance, including

passive features and daylighting, and energy-efficient construction and appliance information.

For Solar Pros—A New Marketing Channel

As a distributed energy option, the solar industry relies upon a broad and dispersed network of qualified solar professionals to install and service solar-energy systems. Many of these professionals are self-employed or work for small- or medium-sized companies with limited marketing and sales resources. One of FindSolar.com's main features is its ability to link interested consumers to qualified solar professionals.

Solar professionals can open a free account on FindSolar.com and display an extensive profile of their services and products, and the experience they offer. FindSolar.com then matches these professionals with interested consumers whose specific needs and geographic area fit the profile. Solar-equipment manufacturers can also be listed to help people learn about the many equipment options available. These tools, together with a broad array of educational resources and links, help consumers learn about solar systems, and allow consumers and solar professionals to "speak the same language" and get down to business. This active Web site is designed to engage people and transform an interest into a solar application.

ASES and its partners began an extensive marketing campaign in the fall of 2005 to encourage consumers to use FindSolar.com and connect them with solar professionals. Various cooperative marketing events are planned, as are print and search engine "keyword" marketing campaigns.

Also this past fall, FindSolar.com became an essential component of the ASES's National Solar Tour—a tool that tour-goers can turn to for next steps. Tour-takers see solar-energy systems providing homeowners in their communities with real-life benefits. They discuss the costs and how to take advantage of local, state, and national incentive programs. But how does one adopt the lessons learned to their particular situation? And how does one find and evaluate qualified professional service providers? FindSolar.com helps answer these questions.

To learn more, access www.findsolar.com. UHD

The Author
Scott Cronk is the principal of Energy Matters, LLC, Santa Rosa, California, which specializes in Web site development. Cronk is the lead developer of FindSolar.com. The company is also an IRS E-File Partner and offers online tax software through another of its developments, www.Taxhead.com. Contact him at info@energymatters.net.

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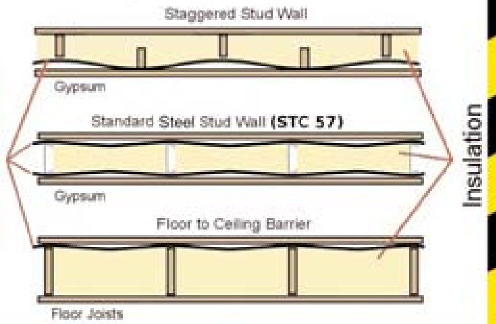

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The Connected Home: an automated future

Demian Martin

Synopsis

- The connected, networked home has become the next big opportunity for many of the big technology companies with Microsoft, Intel, Cisco, and Motorola all having major initiatives focused on this market.
- Whether it is called a connected home or a digital home, the vision is that all of the appliances, entertainment systems, computers, security system, lighting, sprinklers, garage door, toasters, and coffeemakers will all communicate with each other, with the homeowner, and with the Internet.

Exploring Technologies Applicable To The Home

George Jetson was really a metaphor for our collective vision of a very automated future, where the issues were not ones of physical labor but of decision-making. Which button to press? What entertainment to enjoy? And in *Star Trek*, we get a depiction of human beings who have a nearly magical ability to deal with physical challenges, leaving only the familiar all-too-human problems to solve. Now we are quite close to this future, where the possibilities are almost limitless and remarkably available.

At the beginning of the 20th century, electricity was just beginning to get distributed across the United States. Its value was so great that around the world people worked through whatever was necessary to electrify everything. Thousand-year-old stone castles in Europe were electrified because the value of doing so more than made up for the challenges.

Today there are many new compelling technologies with significant potential return for our lives, but challenges stand in the way of introducing them into our homes. In *Ultimate Home Design*, we will endeavor to explain the technologies, show their benefits, challenges, and downsides, and then discuss how to introduce them into your homes. Some of these technologies will have appeal; on the other hand, some will seem pretty pedestrian and not very interesting until you understand the benefits. And some may not be too attractive now but will be compelling in later years, when our physical limitations force us to consider them.

Who Am I?

I have been a technologist, designer, manufacturer, user, and addict of new technology for many years. I have been down many blind alleys, spent many hours getting new things to work, and cursed the bad execution of great ideas and the excellent execution of bad ideas. I had my hands in computers before the microprocessor was invented, and despite all of the bad history, I'm still ready to take on and embrace the promise of the next useful-sounding gadget.

I am currently working as a consultant to companies in the consumer electronics industry, advising on new product design. Previously I directed research and development at Monster Cable, long a mainstay in the infrastructure of premium A/V systems.

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ELECTRONIC lifestyles

Digital Connected Home Of The Future

The connected, networked home has become the next big opportunity for many of the big technology companies. Microsoft, Intel, Cisco, and Motorola all have major initiatives focused on this market. Whether it is called a connected home or a digital home, the vision is that all of the appliances, entertainment systems, computers, security system, lighting, sprinklers, garage door, toasters, and coffeemakers will all communicate with each other, with the homeowner, and with the Internet. This is a brave new world with many potential benefits and many pitfalls. We will be exploring this new world, examining how it works, noting what doesn't work, and assessing what the possible impact on our lives will be.

Networked Entertainment Devices

Traditional audio/video (A/V) components are all isolated devices; they only process the signals from sources that are usually analog or from digital recordings such as DVDs. Technology has recently made it possible to interconnect these devices with digital links, enabling them to share many types of content, control each other, and access content stored on the digital network or on the Internet.

The iPod shows how powerful the networked device can become. It would be useless if there were no network interface from which to load content or update the capabilities. Its runaway success shows that consumers will overcome a reluctance to deal with complexity to gain access to new value and utility.

The expanded capabilities of these networked entertainment devices create new opportunities for linking them with different network interfaces (wireless, wired, and power line), new devices with traditional capabilities, networked enhancements (e.g. DVD players that will play streaming video from the Internet), additional devices for the network that support entertainment such as networked media servers or networked ATSC digital high-definition TV tuners, and externally hosted services such as media servers or home automation managers.

External events are also driving the change. Existing analog TV broadcasting will be discontinued in 2009. The new digital broadcast service has enhanced features that only become useful in new digital systems. Adding networked capability further expands the utility of the new features.

It is likely that in the next three to five years all entertainment products will be networked in some way, and that leads to the distribution problem.

Media Distribution

The first key proposition of this grand vision is that we will want all of our media (video, audio, pictures, etc.) available everywhere in our homes. Video and audio have been possible for almost 60 years with TV, and standalone audio has been available much longer with radio. But our new future uses digital content.

Digital content has some wonderful properties: it does not deteriorate over time nor does it deteriorate as it's passed through a distribution system. However, it does have a major drawback: the digital representation of an audio signal requires 100 times as much bandwidth as does its analog counterpart. Video is just as bad, and it would be almost impossible to manage it digitally if it weren't possible to compress it effectively and remove extra information that doesn't

> **"...there are many new compelling technologies with significant potential return for our lives, but challenges stand in the way of introducing them into our homes."**

contribute much to the final picture. Even so, its bandwidth requirements are substantial, and lots of bandwidth requires specialized infrastructure (or media, as it's sometimes called) and there are many limitations.

We intend to focus primarily on things that can be retrofitted into our homes. Some very neat things are possible when a home is being built, but 99 percent of the homes we live in already exist. And we will want those features in our existing homes. Pulling wires throughout a house is not an easy thing to do, and there are some types of construction (stone or brick, for example) or historic homes that don't permit pulling wires. Although the allure of wireless connection is hard to deny, the greatest challenge is to move the data, and a lot of it at that. High-definition broadcast video requires 20 megabits per second (five times the fastest cable service in the U.S.) for each stream, and it is anticipated that homeowners will want more than one at a time.

Data Distribution

If we can move the video, we should be able to move data. But this ability comes from using common networks and protocols for all of our communication. WiFi has been one of the most dramatic new technology rollouts in history. In a few short years, WiFi went from being a corporate novelty to being pervasive as the way people connect to their broadband and network at home. Hotspots and wireless Internet cafés can be found all over the world. We will be looking for the next generation of WiFi, with its enhanced ability to move data, making it even more irresistible. However, video pushes WiFi's latest products to their limits, and HD really goes beyond the current limits, yet technology is coming to the rescue with new versions of WiFi and other schemes that will boost the network's ability to handle the new demands of A/V Data.

Home Automation

Home Automation is where the George Jetson images actually come into play. We would all like robots doing the mundane chores in our homes, wouldn't we? Well, we actually do have some of them today, yet they're so commonplace, we don't even think of them as robots. For example, our washer and dryer are robots. They take commands from us ("wash like this" or "dry like this") and, through a series of robotic actions, wash and dry our clothes. Home automation, executed well, should be as routine. Lights should simply turn on remotely or decide to turn themselves on. These automated decisions will depend on the available light, the time of day, and the need for light. In many large commercial buildings and hotels, lighting decisions are already very automated. This automation is not installed for its impressive effects or to achieve a special look, it's to save money and energy. These factors will be the key driver for our automated home as well. This is a very broad area with very elaborate systems like Crestron and AMX at one extreme to motion-sensing lighting at the other. We will do our best to separate the pieces of these systems and explain the different underlying communications systems, including the control systems and the devices. The list of such devices keeps growing as ways to connect, and the benefits of connection are applied to so many things.

Energy Efficiency

We will be looking at the future and how close it is with some new technologies that aren't quite out of the lab. Things like off-the-grid power, LED lighting, and remote management are all new developments that aren't ready for us to buy but should be important to our planning. Their benefits can be great, and we need to know them so we can best plan for them when they do roll out.

Conclusion

All of these things will make for a very exciting future for those of us willing to test the limits of our endurance by experimenting with new technology. And this technology will no doubt test the patience of many consumers who believe the packaging's promise of easy setup and installation.

In *Ultimate Home Design*, we plan to bring the best vendors to this forum to present their latest solutions, and we will ask the hard questions, try their wares, and let you know how their products fit together. UHD

The Author

Demian Martin is a technologist, designer, manufacturer, user, and addict of new technology. He is currently working as a consultant to companies in the consumer electronics industry, advising on new product design. Previously, he directed research and development at Monster Cable, long a mainstay in the infrastructure of premium A/V systems. Demian is an Editorial Director of the Electronic Lifestyle Department of *Ultimate Home Design*. He can be reached at demianm_1@yahoo.com.

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ULTIMATE HOMEDESIGN

LIFESTYLE SOLUTIONS via CUSTOM HOME ELECTRONICS

Andy Willcox

Residential Electronics Systems

You'd like to have a plasma TV on your living room wall, but you're not sure how to wire it. It would be great to unleash the music trapped on your iPod and play it through your home stereo. Come to think of it, you'd love to listen to CDs, satellite radio, and TV music channels in many rooms, not just the one where the A/V system is stashed. And you crave your own home theatre, where you can watch your favorite movies on the big screen without the worries of parking, $5 popcorn, and the tall guy that always seems to block your view.

All of these lifestyle solutions are readily available, but unless you're a wiz at sawing holes in the wall for loudspeakers, running wires behind walls, and programming a universal remote control for all your audio and video gear, your home electronics system will likely fall far short of its potential. Most do-it-yourselfers compromise either on the quality of the electronics, ease-of-use, or the aesthetics of the home—or all three. It doesn't have to be that way.

Synopsis

- Today's most successful residential electronics systems are an artful combination of cutting-edge technology, intuitive operation, and respect for interior design.
- To bring these disparate—and sometimes competing—pursuits together requires an experienced professional who is well-versed in the various disciplines that make up the home electronics landscape.
- For homeowners, one of the biggest benefits of custom electronics is simplified control of a home's increasingly complicated technology.

Thanks to the growing custom home electronics market, you can own the latest audio, video, and home control technology, yet keep the visible electronics to a bare minimum. Loudspeakers mounted flush in a wall or ceiling and flat-screen TVs mounted in a lift at the foot of the bed are just a hint of the types of creative disappearing acts custom electronics professionals employ to preserve the aesthetics of an upscale home.

Today's most successful residential electronics systems are an artful combination of cutting-edge technology, intuitive operation, and respect for interior design. The best electronic systems contractors work with builders, architects, and interior designers at the beginning of a home construction project to ensure that wiring and framing needs are achieved at the appropriate stage of a project so that technology needs can be met without compromising the aesthetics of a home. More and more these custom electronics projects extend beyond the entertainment appeal of multi-room music and home theatre to include lighting and climate control, security, and home networking.

CEDIA Professionals

To bring these disparate—and sometimes competing—pursuits together requires an experienced professional who is well-versed in the various disciplines that make up the home electronics landscape. Members of CEDIA, the Custom Electronic Design & Installation Association (www.cedia.org), have the training and expertise required to integrate electronics and automated control into all aspects of the home. This gives homeowners, interior designers, and architects peace of mind that the integrity of the home environment remains intact while homeowners reap the benefits of the digital age.

> "We are seeing homeowners turn to us just like they turn to electricians for their electrical needs."

CEDIA has quickly become the consumer electronics industry's premier trade association for

custom home electronics. Formed in 1989, the organization has grown from a roomful of custom electronic systems contractor pioneers to more than 3,000 member companies worldwide. The organization's annual EXPO in September has become the launching pad for many upscale electronics products in home theatre, multi-room audio, lighting, home automation, energy conservation, networking, and security. In addition, members attend regional training and certification classes throughout the year to keep abreast of the latest training and technology advances.

CEDIA's purpose is to provide superior education and certification and to try to raise the level of excellence in all components of doing business within our industry. Education includes the latest updates on technology, installation techniques, and business practices. The latter includes classes in ethics, professional conduct, and insurance requirements, which vary from state to state.

CEDIA members can provide consumers, builders, architects, and interior designers a single point of contact for the various electronic needs of a homeowner. We're reaching out to trade associations for designers and builders to create the awareness that with a CEDIA member, you're working with a company that has made a significant investment to demonstrate their certified proficiencies.

Benefits Of Custom Electronics

For homeowners, one of the biggest benefits of custom electronics is simplified control of a home's increasingly complicated technology. A single button press on a touchscreen controller can put an entire home theatre system into gear, eliminating the need to power on separate boxes, switch inputs, and even lower lights, shades, and screens. Professional programmers can automate lights to give your home a lived-in look while you're on vacation and to flash lights in the case of an emergency. And if chosen and correctly programmed to work together, the subsystems of a home can be integrated to work together. A motion sensor could trigger lights to turn on, for instance, or to send an email alert when your daughter arrives home from school. The opportunities for integrating home electronics using phones and the Internet are limitless and will continue to expand in the future.

As technology continues its march into our everyday lives, managing electronic systems and services will require the ongoing expertise of professionals to install, update, and maintain those systems and products. CEDIA sees the low-voltage electronic systems contractor becoming a viable trade within the residential market comparable to electricians, plumbers, and heating, ventilating, and air conditioning (HVAC) subcontractors.

The "Fourth" Trade

Following that trend, CEDIA is working to establish electronic subcontractors along with HVAC electricians and builders as the "fourth" trade. We are seeing homeowners turn to us just like they turn to electricians for their electrical needs. CEDIA plans to pursue fourth trade status through legislative efforts at state and national levels.

Areas of expertise within the proposed fourth trade category comprise all low-voltage electronics, which includes audio and video, home networking for computers and Internet sharing,

CEDIA®
CUSTOM ELECTRONIC DESIGN & INSTALLATION ASSOCIATION

and sophisticated control systems that automate smart HVAC, lighting, security, and appliances within the home.

Having a single point of contact for electronic subsystems will be as important for future homeowners as having a single electrician is today. And because of the constantly changing nature of technology, homeowners will want a contractor well versed in the various areas of technology who can bring them all together into a simple, easy-to-understand package. It's our job to walk prospective clients through all the different custom electronics options available—from HDTV to home theatre to lighting control to managing content—and give them an educated overview of what's available. Once they've learned about all the possibilities, more often, they'll end up wanting much more than they originally planned.

Multimedia Content

Multimedia content will also play a major role in the electronic home going forward. Low-voltage contractors are increasingly in demand as people are hungry for content and information. That content, such as MP3 file downloads and Internet radio, requires Internet access and a fat pipeline into the home. In the new home market, structured wiring packages comprising of Category 5 data cable and RG6 coaxial cable have been the favored conduits for basic home networking—sharing a high-speed Internet connection, computer files, and printers.

MP3 files are just the tip of the iceberg. Video downloads are in their infancy and promise to grow exponentially as copyright protection issues are resolved. HDTV downloads and distribution throughout the home, along with full-motion high-definition videoconferencing, will demand even more bandwidth. Some CEDIA installers are already laying the groundwork for that digital pipeline by running fiber optics cables to meet the high-bandwidth needs of the future.

Preparing For Future Technology

Forming a relationship with a CEDIA installer is as much about the future as it is the present. Preparing for future technology through careful planning, wiring infrastructure, and product selection are part of CEDIA members' mission to guide their customers into the future. Down the road we're looking at new types of video phones, media servers, and multimedia content we can't even imagine now. It's not as far away as we think. The fourth trade is only going to become more of a critical component, as people demand more of these services.

To find a CEDIA electronic systems contractor near you, visit www.cedia.org. UHD

The Author
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"The newest technologies are now available..., helping keep people independent."

Ultimate Home Design

for the delivery of health-care services electronically

Peter Giacalone

Synopsis

- With the wonderful progression in health-care technology and the caring services delivered by professionals, consumers can have the best of it all without leaving the comfort, security, and independence of their own home.
- A number of advances have pulled technology into the home health-care arena.

Fundamental Health-Care Needs

Providing a great service can make most technologies much more beneficial, resulting in greater customer satisfaction and retention. Alleviating a grown child's guilt for not being home to take care of elderly parents, providing independence to the elderly, and ensuring the well-being of all members of a family are invaluable propositions for everyone. So in this day and age, why not ensure that your home, or that of a loved one, is equipped to benefit from any of the many electronic support services available for your home?

Even with all the great technological progress in the home health-care industry, nothing can ever replace the care received through reassuring, human contact. Still, it is satisfying to know that with the introduction of new technology, we now have means of caring for our loved ones in ways never available before.

The fundamental needs of every person will always rely on others to feel cared for and safe. From an infant who seeks his or her mother's soothing voice to an elderly woman who eagerly awaits the visit of a grandchild, the gentleness of humanity is what makes us embrace life and thrive.

As technology continues to evolve, it will never provide a warm touch, an encouraging smile, or a comforting anecdote. There is much value in having people make us feel like everything will be okay when we need them. However, with the wonderful progression in technology and the caring services delivered by professionals, consumers can have the best of it all without leaving the comfort, security, and independence of their own home.

We embrace technology, as we should, because it consistently alerts us when someone or something is in danger. But, without the human element, something will always be missing.

No one recognizes this fact more than the people who work in the home health-care industry. These dedicated individuals are on the front lines everyday, working with people who are in chronic pain, are lonely, and are quickly losing their capacity to think, reason, and judge.

In recent years, there have been a number of advances that have pulled technology into the home health-care arena. While the personal touch is and will always remain the cornerstone of proper home health-care, we have been able to create "compassionate technology," which can better link people together in times of crisis.

Home Monitoring Services

This begins with the new generation of home monitoring companies, who understand that true personal safety and wellness cannot rely solely on electronics, monitors, wires, and loudspeakers.

Such security companies understand and appreciate the need for universal design as a new home design paradigm, and now offer services that cater to the latest in construction and remodeling.

The newest technologies are now available to help keep people independent. From remote emergency activation pendants to inactivity motion detectors, technology can now perfectly complement new home design and help ensure that the elderly and people with disabilities remain active. For higher risk people, medication reminders can be installed, with monitoring representatives calling when an individual forgets to take prescribed medicine.

Because of a system known as two-way voice communication, seniors and others with medical needs can now communicate with licensed nurses and other medical emergency-response professionals through a hands-free communication system. This technology is easily installed and offers great peace of mind for the consumer. This system, in addition to a pendant or bracelet transmitter, can be active 24 hours a day, 365 days a year.

Prior to the founding of our company, SafetyCare™, we hired an independent marketing research firm to conduct consumer focus group sessions. The findings showed that in order to supplement the security and medical products they were purchasing, consumers wanted access to security and medical professionals 24 hours a day for questions or concerns about personal safety and health.

The focus group clearly identified the importance of having immediate voice access to medical and emergency response professionals, especially when caring for an elderly parent or a person with disabilities.

While "house calls" were a fundamental part of society generations ago, people still crave such one-on-one care from another human. Many of those in the pre-War and "baby-boomer" generations remember the effort a doctor took to come to a family's home during emergency situations. Now, because of the advent of communication technology, "house calls"—just recently regarded as "ancient"—are now innovative.

Much like a "house call," two-way voice communication is reinventing the home health-care industry, bringing much peace of mind to family members spanning several generations.

As the baby-boomer generation continues to age, medical emergency bracelets and diagnostic devices can't ensure the well-being of this generation—more than 70 million Americans —who are expected to swell by 21 percent within five years.

This aging population will need nurses on call to discuss health-related questions, counselors on call to handle day-to-day anxiety or grief-related issues, and, of course, emergency responders for such situations as break-ins, floods, or carbon monoxide leaks.

What is more, the adult-aged children of the post-War and baby-boomer generations are finding it increasingly difficult to cope with the stresses of work, home, children, and now their aging parents. Peace of mind is lost when balancing work, family commitments, and the ever-changing medical conditions of parents.

And, as anyone in the home health-care industry knows, peace of mind is the most precious commodity for consumers.

As SafetyCare found during our focus group sessions, it is critically important that consumers remain confident that the professional they confide in is trained to provide the right response, whatever need arises. That is why two-way voice communication relieves the stress and anxiety of caretakers, allowing them to more effectively care for elderly parents while more easily balancing their own personal roles as parent, family member, friend, and colleague.

SafetyCare's team of experienced security and wellness professionals provide much more than monitoring burglar alarms and motion detectors. Aside from burglary, smoke, fire, carbon monoxide, flood, and frozen-pipe monitoring, another important and interesting capability of two-way voice communication is its ability to assist families through normal day-to-day living, such as stress, loneliness, family issues, or conflict resolution.

And such vital services mean everything to those who provide home health care.

Knowing your loved ones have the most up-to-date technology, such as medical record archiving, Global Positioning System (GPS) tracking capabilities, inactivity detectors, and medication alerts, along with 24-hour access to psychologists, counselors, licensed nurses, EMTs, and police, fire, and emergency officials is priceless to this group of customers.

More than an interesting technology, two-way voice communication is an important service that saves lives and enhances the quality of life.

In the coming months, watch two-way voice communication—the "21st Century House Call"—revolutionize home health care, bringing a touch of soul to our technological world.

For more information, visit www.safetycare.us. UHD

The Author

Peter P. Giacalone is Executive Vice President of SafetyCare, Inc, the first company in America to offer unified protection services for the family. SafetyCare is the forerunner of an entirely new breed of service; including proactive monitoring— one that comprises every aspect of safeguarding families' physical as well as psychological well-being. He is Chairman of both the Security Industry Association Audio Verification Standards Committee and Central Station Alarm Associations Audio Verification Operations Standards Committee. Peter can be reached at pgiacalone@safetycare.us.

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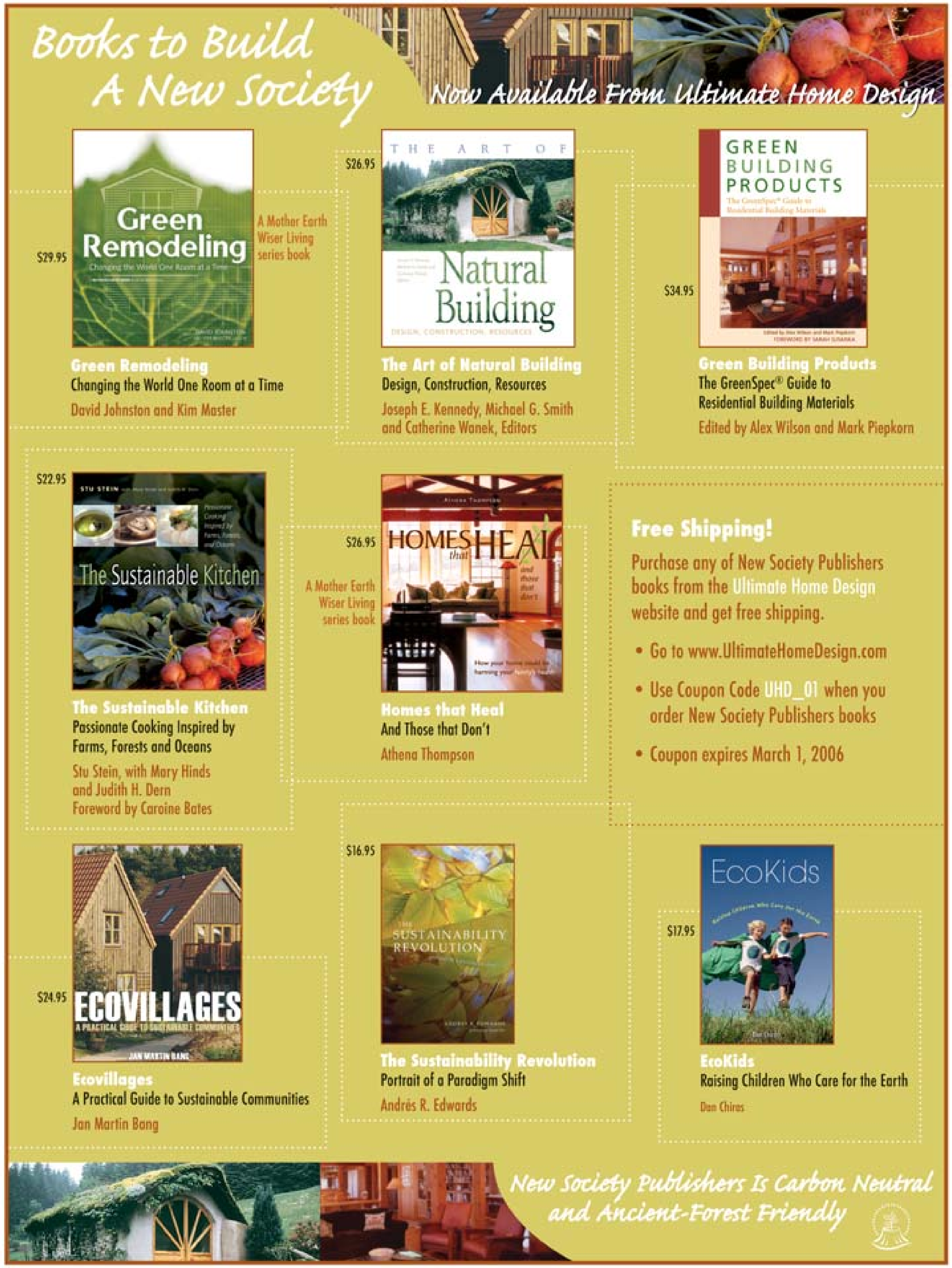

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